1.

For $(1+r/100)^2 > 1.15$:-

1. assume $(1+r/100)^2 = 1.16$ solving for 'r', we get r = 7(less than 8)

2. assume $(1+r/100)^2 = 1.44$ solving for 'r', we get r = 12(greater than 8)

so clearly insufficient since we get 2 different answers for the scenarios mentioned.
A quick way to estimate sqrt(1.15) is to note that 1.15>1, so sqrt(1.15)>sqrt(1)=1. But 1.15^2 is too high, obviously greater than 1.15. The midpoint of 1.07 or 1.08 is close, so check those by squaring. $1.08^2 = 116.64$ (too high). $1.07^2 = 114.49$ (too low). Therefore r > 7

We would need n if the question concerned the value of I. However, this question is actually a Yes/No question concerning only the value of r: Is r > 8? Statement (2) is only insufficient because the computed range of r includes values both above and below 8.
Ans. A

2.

OA: B

take it one statement at a time, and see what you can do with the facts.
(1)
taking this statement in combination with the 4% statistic cited in the prompt, we have that 16 = 4% of the total number of students studying french. this means that 400 students are studying french.
all we know is that 'at least 100' are studying japanese; that figure could be greater than, equal to, or less than 400, so, insufficient.

(2)
let 'Q' stand for the number of students who study BOTH french and japanese.
we have no idea of the size of 'Q', BUT:
-- Q is 4% of the number of students studying french (as stated in the prompt)
-- Q is 10% of the number of students studying japanese
these two facts together imply that the number of students studying french MUST be larger, because the same quantity Q is a smaller percentage of that number. (if you're interested, the number of students taking french must be exactly 10/4 times the number of students taking japanese for these equations to hold simultaneously.)
sufficient

answer = b

3.

all you need is two variables: J for the original price of the jacket, and S for the original price of the shirt. then the sale prices are 0.85J and 0.8S, respectively.

What is J - S ?
(1) $0.85J = 0.9S + 83$
(2) $J = 140$

this is somewhat unusual, in that the correct answer is actually (c), which is the "naive guess" (just substitute #2 into #1).

--

of note, however, is the fact that, **if both sales were the same % discount, then the answer would be (a), not (c).**

for instance, let's say both sales are 15% off, rather than one 15% and one 10%.
in that case, statement (1) becomes 0.85J = 0.85S + 83, which can be rearranged to 0.85(J - S) = 83. in that case, we can isolate (J - S), so in that case (1) would be sufficient!

4.

Please look at the sentence carefully. **In Jefferson School, 300 students study French or Spanish or both.**

The hidden information is that the number of students who don't read either spanish or french is 0.

Taking case I .. The matrix would be

	F	not F	Total
S			
not S		0	60
Total		100	300

I think you can easily find out that number of students reading both french and spanish is 140.

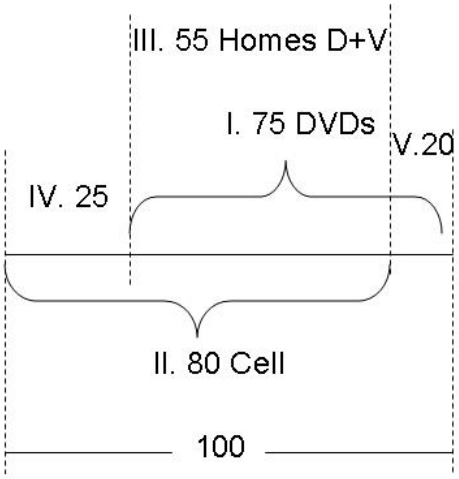
Taking case II .. The matrix would be

	F	not F	Total
S			240
not S		0	
Total		100	300

Again you can find out that number of students reading both french and spanish is 140.

Hence in each of the cases above you can find out the required information. So, D

5.



In Fig above,
Step 1: Assign DVD homes from right = 75 homes
Step 2: Assign Cell homes from left = 80 homes
Step 3: We now know 55 homes have D+C (typo in fig)
We have 55 MP3s that we can distribute all to D+C (which gives us max as 55) or distribute 25 to portion IV and 20 to portion V and the rest 10 to portion III and so the minimum would be portion III which is 10 homes.

Answer 45.

OR

First we need to figure out what the maximum is. We know it is possible there are 55 with all three, since the 55 MP3 owners is smallest set of the three. (Max = # of MP3)

To calculate the fewest possible, we first need to figure out how many must have all three devices. (max possible - max without all three = minimum with all three).

Of the 80 cell phone owners, 25 cannot have an MP3 player
80 - 55 = 25.

Similarly, 20 of the DVD owners cannot have an MP3 player.
75 - 55 = 20.

If the owners who do not have all three are unique (no overlap), we get the maximum number of owners who do not own an MP3 player, and thus cannot own all three devices.

Max possible - maximum without all three = minimum number of people with all three devices.
55 - 45 = 10

Now we can solve:

55 - 10 = 45.

OR

Answer : 45

The question says about minimum number not maximum amount so let say all the villagers has all the devices .
X= 100 for the minimum say "55 have at least one MP3 player" so lets say that 55 of them had all 3 of them as this assertion also keeps the question true only
100 - 55 = 45

consider the two limited cases. 1) As much of the "overlap" as possible occurs in three device households and 2) As much of the overlap as possible occurs in exactly two device households, minimizing the number of two device households.

1) This is the easy case - just assume all the overlap occurs in three device households. Let X = number of homes with all three devices. We know that 75-80-55-2X=100. so X=55. You have to use 2x in the equation above because the region where all three overlap is triply counted. So in this case, 20 households have only a DVD player, 25 have only a cell phone, 0 have only a MP3 player and 55 households have all three.

2) Here it's tempting to guess that it's possible to have all the overlap occur in households that have exactly two of the devices, therefore X-Y = 55. Alas, there is no way to distribute the exactly two device households in a way that works without having any 3-device households. After drawing the diagram and interating, you can see that you need at least 10 3-device households, so X-Y= 55-10 = 45. It's important to be careful to keep track if you are dealing with "at least" or "exactly" two device households.

6.

27 is, indeed, the TOTAL number of houses with pools. regardless of whether there's a patio.
the number of houses with *only* a swimming pool is actually still unknown in statement 2; note that there's still an "x" in the expression.

actually, this is pretty straightforward.

if there are 2 overlapping criteria, then use the matrix.
if there are 3 overlapping criteria, then use a venn diagram.
that's it.

do not EVER use a venn diagram to solve problems with 2 overlapping criteria, unless you like to make things harder than they should be.

It probably looked something like this:

	Patio	No Patio	Total
Pool			x
No Pool			
Total	48	27	75

Statement (1) tells us:

	Patio	No Patio	Total
Pool	10		x
No Pool	38		
Total	48	27	75

This is insufficient.

Statement (2) tells us:

	Patio	No Patio	Total
Pool	y	27-y = x-y	x
No Pool		y	
Total	48	27	75

So 27 - y = x - y
x = 27
Statement (2) is sufficient, so the answer is (B).

7.

OA - 25

Since the ratio of concentrate to water is 1:3 so in a can of 12 ounce concentrate the water required will be 12 * 3= 36 ounce
So therefore if there are 'X' cans of 12- ounces then the juice will be
(12+36) * X which is the required quantity.
i.e
48 * x = 200 * 6
So X= 25

8.

I is not sufficient.
It should be 22 chairs,less than 24 : total cost $29.92, **less** than 30
25 chairs, *more than 24* : total cost $34, *greater than 30*

Then the answer can be inferred as B

Total cost = 10 + (n-1)*1 = 9 + n

statement I

total cost > 30 ---> 9 + n > 30 ---> n > 21 well this is insufficient since n could be 22 or 25 cross out A

and D

statement II

average = total cost/n = (9 + n)/n = 1.36 since you can calculate the exact value of n this is sufficient to answer the question. If you solve the equation, you get n = 25 sufficient

9.

Ultimately we need to get (Errors by B) / (Customers of B). this is our rephrased quantity.

it's clear that statement (2) is insufficient to answer the question, so let's focus on statement (1).

Statement (2): The overall service-error rate = 100* total service errors / number of customers
= 100 * (errors by A + errors by B) / (customers of A + customers of B)

Let's fill in the info we have:
1.5 = 100 * (86 + errors by B) / (4850 + additional customers of B)
7275 + 1.5 * (additional customers) = 8600 + 100 (errors by B)
1.5 * (additional customers of B) = 1325 + 100 (errors by B)

There's no way to get (errors by B)/(customers of B).

Statements (1) + (2) Together:
With the final equation above:
1.5 * (additional customers of B) = 1325 + 100 (errors by B)
1.5 * (9350) = 1325 + 100 (errors by B)

Now this is much more managable. We can find number of errors by B, the fraction of errors per customer, and service-error rate. The answer is (C).

11.

BACKGROUND:
this is one of the test's most time-worn trick questions: a weighted average that seems as though it's going to work, but is presented with units that make the answer counterintuitive.
the most common variation on this theme is the 'round trip problem', in which someone travels to and fro at different speeds. for instance, say you travel a 120-mile round trip (60 miles each way), at 30mph on the way there and 20mph on the way back. is the average speed 25mph? no way.

you have to calculate the average speed the old-fashioned way: find the total distance (120 miles) and divide by total time (2 hours there + 3 hours back = 5 hours), for an average speed of 120/5 = 24mph.

the most important realization for you to make here is that the two trips take different TIMES, and that speeds have TIMES as their denominators. if the two legs of the journey each took tho same amount of TIME (which would make one of them longer than the other), then you could calculate an average speed in the way you normally create averages of everything else.

SO WHAT DOES THIS HAVE TO DO WITH THE ABOVE PROBLEM?
same deal. you're trying to find average miles PER GALLON, but the legs of the journey are given in miles (not gallons). therefore, you can't calculate the average using the simple method for weighted averages. instead, you have to do the problem the old-fashioned way again:
* figure the total miles (60 miles)

* figure the total gallons (10/25 = 2/5 = 0.4 gallons city, 50/40 = 5/4 = 1.25 gallons highway, for a total of 33/20 = 1.65 gallons)
* divide: 60 miles / 1.65 gallons = 60 miles / (33/20) gallons
which is about 36 miles/gallon, by long division.

33/20 is the sum of 2/5 and 5/4 (the numbers of gallons consumed at each step).

the car goes 10 miles in the city and 50 miles on the highway. that's a total of 10 + 50 = 60 miles.

11.

Let f be processing fee per order and x $ as shipping charge per book.
So Total charge for Rajiv's order is 5f+15x (jan to may)

Statement 1.
Charge for Jan = f+ x
Charge for March = f+ 3x

Difference is 2x = 1$
x= 0.5$

Statement 2.

Total shipping charge is 5x+4x+3x+2x+1x= 15x
15x=7.5$
x=0.5$

Combining both all we get is shipping charges per book. Still cant find f.
hence ans (E)

12.

Find the rates for all 3:
Pump A will drain 1/3 of container in 1 hour
Pump B will drain 1/2 of container in 1 hour
Pump C will fill 1/6 of container in 1 hour.

So combined A+B+C will drain (1/3+1/2-1/6=4/6) container in 1 hour. Notice the negative sign for opposite action.

So 1/2 of container will be drained in [(1/2)*(6/4)] hours = 45 minutes. Answer is B.

13.

1) T= D/R

2) Question asks for T1/T2

3) Second statement says Y=20

4) Set up equation using Y=20:

(D1/R1)/(D2/R2)=

100 X [(20/R1) X (R2/20)]

5) Plug in Rates:

(20/X) X (1.25X/20)

6) At this point, realize that the "X"'s cross out, stop calculating and realize that B is sufficient.
From the question, I see that there are two situations we are comparing:
(1) The time for traveling x mph for the first y miles and 1.25x mph for the last 40-y miles. We'll call this T1.
(2) The time for traveling x mph the entire 40 miles. We'll call this T2.

We want to find T1 / T2 * 100%

Let's rephrase T2 first. Time = Distance / Rate, so T2 = 40 miles / x mph = 40/x hours.

Now let's take a look at T1. Using an RTD Chart:
----------Rate * Time = Distance-----
1st Part x mph * ?? = y miles
2nd Part 1.25x mph * ?? = 40-y miles

The time for the first part is y/x hours, and the time for the second part is (40-y)/(1.25x) hours.

T1/T2 = [y/x + (40-y/1.25x)] / (40/x)
= (y + (40-y)/1.25)/40
= (1.25y + 40 - y) / 50
= (0.25 y + 40)/50

Our rephrased question is "what is y?"

Clearly (2) alone is clearly sufficient, so (B) is the answer.

The actual time Marta spent, let's call that T1, is the combination of the first y miles at x mph and the second 40-y miles at 1.25x mph.

If she had traveled x mph the whole time, her new time T2 = 40/x.

The question is asking T1 is what percent of T2? In other words, T1 = (P/100)*T2.

14.

Step 1: I is insufficient
Step 2: statement

rt = 400 (from question)
r= 400/t

(r+20)(t-1) = 400 (from statement II)
rt - r +20t - 20 = 400
rt - r +20t = 420
r(t-1) + 20t = 420

Input r = 400/t (from question) for r above:

400/t (t-1) + 20t = 420

400 - 400/t + 20t = 420
To solve the rest (in case anyone cares) then you'd move 420 over to get
-20 - 400/t + 20t = 0 then multiply each term by t
-20t - 400 + 20t^2 = 0 divide everything by 20
t^2 - t - 20 = 0
(t-5)(t+4) = 0
t = 5 or -4.

15.

OA is D.

Let the total students who eat in the cafeteria be 'x'.
therefore we can say that 2x/3 dislike lima beans
and 3/5 (2x/3) = 2x/5 dislike both lima beans and brussels sprouts.
So students who dislike only lima beans (and like brussels sprouts) = 2x/3 - 2x/5 = 4x/15 ---- (i)

Statement 1 => x = 120
From (i) => Students who like brussel sprouts but dislike Lima beans = 4x/15 = 32

Hence Statement 1 is sufficient.

Statement 2 => 40 students like Lima beans = (x-40) students dislike Lima Beans = 2x/3 ==> x = 120 which is statement 1. Hence Statement 2 is sufficient

Answer : D

(1)
120 students total
--> 40 YES LIMA, 80 NO LIMA
split up the NO LIMA crowd:
--> 3/5 of 80 = 48 NO LIMA + YES BRUSSELS
--> 2/5 of 80 = 36 NO LIMA + YES BRUSSELS
sufficient

(2)
the fraction 2/3 tells you that the other 1/3 like lima beans (so that the ratio YES LIMA : NO LIMA is 1 : 2)
therefore, x (the unknown multiplier) = 40, and 2x is therefore 80
--> 40 YES LIMA, 80 NO LIMA
rest of the problem proceeds as above
sufficient

answer = d

16.

This is one way to solve this, using weighted averages:
72% male apply; therefore 28% male don't apply
80% female apply; therefore 20% female don't apply

I want to know what fraction of students is male. I could get this one of two ways:
a) the actual number of males in the class and the actual total number of students in the class (# male / # total)
b) the proportion or percentage of male students to female (which, together, comprise the total - so I don't necessarily need to know the actual numbers in order to know a percentage)

(1) 840 = m + f. I don't know actual numbers for male and female. I also don't know proportions for male / female. Can't do it.

(2) 75% of all students (m+f) have applied. Don't know actual numbers for male and female. I can, however, figure out proportions. If 72% of males apply, and 80% of females apply, and 75% overall apply, then I can figure out the proportion of males to females in the class - this is a weighted average problem.

Here's how: 8 percentage points separate the males and the females (80-72). The overall average, 75, is 3 points away from the males (at 72) and 5 points away from the females (at 80). This means there are more males than females and, further, it tells me the actual proportion. Of every 8 students, 5 are male and 3 are female. (If there were equal numbers of males and females, the overall average would be 76%, or 4 points away from each. Because the overall number is closer to the male percentage, the males have more of an impact on the final number. Further, the proportion of males to females is equal to that skew - a 50/50 weighting would mean that each group "pulled" the average by 4 points. Since the males "pulled" the average one point closer to them, they have a weighting of 5, and the females lose that point for a weighting of 3.)

So, 5/8 of the students are male and 3/8 are female.

This is another way to solve this, using double-set matrix:

----------male-------fem-------t
apply----------.72x-------.8y-------
not apply-----.28x--------.2y------
t----------x-----------y-------x+y
The above is from the question stem

Statement 1:
----------male-------fem-------t
apply----------.72x-------.8y-------
not apply-----.28x--------.2y------
t----------x-----------y-------840
Can't use the above to find out x.

Statement 2:
----------male-------fem-------t
apply----------.72x-------.8y-------.75(x+y)
not apply-----.28x--------.2y------.25(x+y)
t----------x-----------y-------x+y

.72x + .8y = .75(x+y) = .75x + .75y
I'm trying to find x. I can simplify the equation to .5y = .3x or 5y = 3x. I would get the same proportion

if I wrote out and simplified the second equation (from the "not apply" line). So, basically, I'd need to multiply y (females) by 5 and x (males) by 3 to make them equal. This means that x (male) is bigger than y (female) and that they are in the proportion 5 males to 3 females.

The question is what proportion of all students are males, and I know that for every 5 males there are 3 females. 5+3 = 8 total, so 5/8 of the students are males. Sufficient.

17.

.2A = Will not attend
.8A = Will attend

Question is how many need to be accepted?

.8A = x
A = x/.8
A = 1.25x

Hope that helps.

If 100 students are accepted, 80 will attend. So let's make the planned enrollment x = 80. Therefore, the college must admit 100 students, so the answer that equals 100 when we plug in 80 for x is correct.

A. 1.05x = (1.05)(80) = 84
B. 1.1x = 88
C. 1.2x = 96
D. 1.25x = 100 ---> CORRECT.
E. 1.8x = 144

18.

The answer is (B)

From (2) total no of participants attended afternoon session = (7/8)* 128 = 112. Out of 128, 112 attended afternoon session. Hence the no. of people who did not attend afternoon session or who attended morning session = 128-112 = 16. Sufficient

From (1) 3/4 of 128 = 96 people attended both the sessions. But we have no information about rest of the people.

The key to setting up the Double Set Matrix is that the two columns are opposite, mutually exclusive qualities (A and not-A). Same for the rows.

The trick here is recognizing that morning session is NOT the opposite of the afternoon session. Attending the morning session IS the opposite of *not* attending the morning session.

Here's what the matrix would look like for statement (2):
----------AM----not-AM------Total
PM---------unk------unk----(7/8)128 = 112
not-PM-----16-------0-------(1/8)128 = 16
Total-------unk------unk------128

By "unk" I mean the value is unknown--you could write alg expressions for these boxes, but wouldn't be

able to solve. But you don't need to: We have the AM/not-PM box populated with the answer, which is 16.

19.

OA is 500/x%.

consider that travel time for 5 miles @30mph = t1
travel time for (x-5) miles @ 60mph= t2
and travel time if driven all along by 60 mph is = t3.

Don would take more time by driving at variable speeds of 30 mph and 60mph than he'd take to drive at constant speed of 60mph.

So, reqd % increase = [(t1+t2) - t3]/ t3 * 100

Now, t1 = 5/30 = 1/6
t2 = (x-5)/60
t3 = x/60

Solving, you'll get the % increase to be 500/x %.

Solution:
x can be broken as: *5 miles* and *x-5 miles*
dert (*distance=rate*time*)
hence for 5 mile case, t=d/r=5/30
for next journey: t=x-5/60
so total time is: 5/30+(x-5)/60=(x+5)/60

If the journey were only due to 60mph, then t=x/60

now, confusing word problem: His travel time was what % greater than.....60 miles /hr. So this happens to be in the following form..

org travel time-travel time with 60mph *100%
---
travel time with 60mph

x/60+5/60-x/60
---------- *100%
x/60

5/60*60/x*100%=500%/x.....OA

20.

first, realize that the $1.6bn figure is irrelevant, since *everything* else in the problem is stated purely in terms of percentages. therefore, you should concentrate only on percentages.

(2) alone
- to try to make country x NOT in the top six, distribute the percentages as evenly as possible: it's possible that each of the six highest-contributing countries paid 67.8/6 = 11.3 percent of the total. if that were the case, then country x, at 4.8%, would be lower than sixth place.

- to try to get country x INTO the top six, make the distribution as lopsided as possible: say one country paid 60% of everything. then country x could be second at 4.8%, and the 3rd, 4th, 5th, 6th place countries could combine to pay 67.8 - 64.8%.
INSUFFICIENT

(1) alone
taken alone, this condition only tells you that country x is in fifth place or lower.
INSUFFICIENT

(together)
the fifth- and sixth-place countries together paid out 67.8 - 56 = 11.8 percent of the total. at this point the strategy is roughly the same as for statement (2) alone:
- to try to make country x NOT in the top six, distribute the percentages as evenly as possible: the fifth- and sixth-place countries could both have contributed 11.8/2 = 5.9 percent. this would mean country x = not in the top six.
- to try to get country x INTO the top six, let the fifth-place country pay 11.8 - 4.8 = 7 percent; therefore country x is in sixth place.
INSUFFICIENT

answer = e

21.

Lets assume company had x clients at the begining of the year and it acquired y clients during the year.

Question is asking what is the ratio (y+x) / x

St 1.
x/y = 12/1
y=x/12

x+y/x
plugging y=x/12, the above ratio is 13/12.

SUFFICIENT

St. 2 x=144, y = not known.
INSUFFICIENT

Ans A.

When attempting ratio problems, I like using the unknown multiplier.

This means if "The ratio of the number of clients that Company X had at the beginning of last year to the number of new clients that it acquired during the year was 12 to 1," then the number of clients at the beginning of the year is 12n, new clients is n.

We're looking for the ratio of (end of year clients) / (beginning of year clients), or (12n + n) / (12n) = (13n)/(12n) = 13/12.

So (1) is sufficient, and (A) is the answer.

22.

Find the rates:
X - 1/15 of work in 1 hour
Y - 1/18 of work in 1 hour
So X+Y - (1/15 + 1/18 = 11/90) in 1 hour

Now how much work is done:
X did 6/15
X+Y did 11/30
Remaining work = 1-(6/15+11/30) = 7/30

So Y will take 18*7/30 = 21/5 hours. (E)

23.

I think it helps to try to rephrase the question. Since rate * time = distance, we can translate the question as:
Is (r)(0.5) > 6?

We can manipulate this by dividing both sides by 0.5. Now it's rephrased as:
Is r > 12 mph?

Noticing that the statements are in feet/second, we should convert 12mph to ft/sec. (12mi/hr) * (1hr/3600 s) * (5280 ft/1 mi) = 5280/300 = 17.6 ft/sec.

Is r > 17.6 ft/sec?

(1) Says r > 16 ft/sec. This is insufficient. r could be less than or greater than 17.6.

(2) says r < 18 ft/sec. This is also insufficient. r could be either less than or greater than 17.6.

Putting (1) and (2) together, 16 < r < 18. We still do not know for sure that r > 17.6. The answer is (E).

24.
We are looking for the quantity and not the dollar value spent, the answer would have to be E. Can someone please confirm?

if you have the two equations together, you can find out the price of each item (specifically, 40 cents for a doughnut and 30 cents for a cupcake). however, this still doesn't tell you how many of each item lew bought, since there are many, many ways to get a total of $6.00 from units of 40 cents and 30 cents.

25.

Answer is B.

The chart would look something like this:

----------6 machines-----6+x machines
Rate----------y----------y----------(rate is same)

Time --------12----------8---------(in days)

Work--------1 job----------1 job

Remember that rt=w. Then, fill in what you know and get to work! Jad suggested picking the setting the size of the job to 72 units to make things easier eg, 6 machines do 12y work and 6+x machines do 8y work. You can get the rate from the first equation (the 6 machines column): if 6 machines do 12y work (and complete the job), then each machine does 2y work (or 1/6 of the total job) over that 12 day period, which also translates to (1/6) * (1/12) or 1/72 of the job per machine per day. Well, that's an annoying number! So say the whole job is 72 widgets and each machine produces one widget (or 1/72 of the job) per day.

26.

The correct answer is B

	Motorist get tickets	Motorist do not get tickets.	total
Motorist Exceed Speed Limit	10	.20x	x
Motorist Do not Ex.L			

From grid 1 we know:

10 + .20x = x
10 = .80x

x = 100/8 = 12.5

thus, answer B

Let 100 be the total no of motorist....

Hence those who get ticket and exceed speed limit = 10

Let x be the no of motorist who exceed the limit.

Hence we have the equation :
x = 0.2x + 10
x = 10/0.8 = 12.5

27.

it can be done in about 30 sec, as long as you remember to plug in the answers. You know you need to multiply something x 13 to get to 800,000.

Start with 6,000 because it's easier, as soon as you figure out that 13x6 is 78, you'll know that the answer must be higher - which leaves you with E.

x= 400*100 / 6.5 = 800000/13 and once i start the calculation it will tell that it cant be 6000 so has to be E.

28.

Answer is C

Question stem tells you that p $ for 1st load and q $ for additional loaf.

1. if someone buys 2 loaf , he will be charged p+q $.
price per laof = (p+q) / 2 $

if one buys only 1 loaf then one pays only p $

St1 tells that

(p+q)/2 = (1-10%) p
p/2+q/2 = 9/10p
q=0.8 p

Cant figure out p insuffcient.

2. 6 loaves price is p+5q given as 10$
p+5q=10

Insufficent.

Together 1 & 2
p+5*0.8p = 10
p =2$

29.

Let x be the number of shirts sold, and let y be the number of sweaters sold. The question can be rephrased as "Is y>x?".
The question also tells us the prices of the shirts and sweaters, so we know that the average price of all the shirts and sweaters that the store sold during the sale was (15x + 25y) / 2.

Statement (1) is sufficient. It tells us that the the average equals 21. Knowing that [(15x + 25y) / 2] is closer to 25 than to 15 tells us that y is greater than x. (If y=x, the average is exactly 20. If y<x, the average is less than 20. If y>x, the average is greater than 20. You can test a few numbers for x and y to persuade yourself of this.)

Statement (2) is not sufficient. It tells us that 15x + 25y =420, which is not enough to tell us whether y>x. That's because y could be greater than x (when y=12 and x=8) **or** less than x (when y=3 and x=23).

Since statement (1) is sufficient and statement (2) is not sufficient, the answer is (A).

30.

statement (1) is the easier statement: if all you know is that she bought 6 pencils, you of course have no idea how many of those 6 were of each type. this statement is therefore insufficient.

statement (2):
you have 21x + 23y = 130. because that's one equation in two variables, your first instinct is probably to say 'insufficient!!'
the problem here, though, is that this equation must have solutions that are **nonnegative integers** (and is therefore called a 'diophantine equation', if you like mathematical terms). because of that restriction, it's quite possible that there's only one feasible solution; the only way to find out within a reasonable amount of time is to exhaust the possibilities:
let 'C' stand for the cheap pencil, and 'E' for the expensive one.
buy NO C's: could spend 0, 23, 46, 69, 92, 115, 138, ... (no 130)
buy ONE C: could spend 21, 44, 67, 90, 113, 136, ... (no 130)
buy TWO C's: could spend 42, 65, 88, 111, 134, ... (no 130)
buy THREE C's: could spend 63, 86, 109, 132, ... (no 130)
buy FOUR C's: could spend 84, 107, **130** (aha)
buy FIVE C's: could spend 105, 128 ... (no 130)
buy SIX C's: could spend 126, ... (no 130)
if you buy seven or more C's, you've already spent more than 130.
only one possibility works
sufficient

answer = b

31.

Answer is C

Question requires us to calculate the ratio =
amount disposed / amount recycled.

A. 142800 / 16700 = Between 8 and 9 (no short cut just divided high level)

B. 48000 / 8800 = Between 5 & 6

C. 51400 / 13000 = Less Than 4 (13000 * 4 = 52000)

D. 20300 / 3900 = More Than 5

E. 16200 / 3300 = CLose to 5 (3300 * 5 = 16500)

well, you would do good to **look over the numbers before you start diving into calculations**.

clearly (a) contains obnoxious numbers FOR THE PRECISE PURPOSE OF GETTING YOU TO WASTE YOUR TIME, if you just forge ahead and start calculating without looking at anything else.

if you look at the other choices, rough estimation will show you that they are in the 4-5-6 range.

looking back at (a), it's clearly bigger than that. if the right hand side were 167,000, it would be 10:1. and the right-hand side is pretty close to that big. so there's no need to calculate (a) at all, much less to throw a whole bunch of time at it.

takeaway:
if a problem contains a whole bunch of calculations that have to be done, then you should LOOK FOR THE EASIEST CALCULATIONS, AND DO THEM FIRST.

takeaway #2:
there is no law requiring you to deal with choice (a) first.

32.
Answer: C

Lets say Income is I

1% of income = I/100
2% of Income = 2I/100

Arithmetic Mean = (I/100 + 100C)/2 (Where C denotes the currency)

Therefore Total = 2I/100 + I/200 + 50
= 5I/200 + 50
Therefore C

the principal challenge of this problem is the sheer length of the wording in the problem statement: there are just a ton of words crammed into a rather small amount of space.

when you parse something like this, you should try your best to break it down into smaller parts:
add 2 percent of one's annual income to the average (arithmetic mean) of **100 units of country R's currency** and **1 percent of one's annual income**.
this is somewhat difficult to do on gmat problems, because you don't have a pre-printed piece of paper on which you can simply block things off and underline things; you'll have to write this stuff out on the yellow pad with which you're supplied at the exam.

33.
Correct answer: (E)

remember that **rate = reciprocal of time taken to complete one job**.
also, remember that rates are additive, so rate(pumps a AND b) = rate(pump a) + rate(pump b).
so:
rate(pumps a AND b) = 5/6
rate(pumps a AND c) = 2/3
rate(pumps b AND c) = 1/2

using the above fact about additive rates,
rate(pump a) + rate(pump b) = 5/6
rate(pump a) + rate(pump c) = 2/3
rate(pump b) + rate(pump c) = 1/2

you know you want the rate for all three pumps. from the symmetry of the above equations, it becomes apparent that we can find this by **adding together all 3 equations**:
2rate(pump a) + 2rate(pump b) + 2rate(pump c) = 5/6 + 2/3 + 1/2 = 2
rate(pump a) + rate(pump b) + rate(pump c) = 1
rate(pumps a AND b AND c) = 1 (because rates are additive)
time = reciprocal of 1 = 1

34.
correct answer is E

(1) is not enough…

IF you're *assuming that the price of the sofas is constant* - a completely unfounded assumption. if you were guaranteed that the sofas were selling at the same price for which they sold last year, then (1) would mean the revenue was 10% greater ... but you have no such guarantee.

since you know *nothing* about the price at which the sofas sold this year vis-a-vis last year, you know nothing about the percent increase in revenue.

--

(2) doesn't help, either, because we have no information about the # of sofas sold (which is clearly a relevant concern).

--

together: still not good enough, because we don't have any value to which to **compare** $30. for instance, if the sofas were $50 last year and $80 this year, that's going to be a very large percent increase; if sofas were $1000 last year and $1030 this year, the percent increase will be very small.

What if we consider the # of sofas sold and their price to be 100 for the last year? Won't we be getting the required % ?

you can only pick numbers when you *don't lose any generality* by doing so. in other words, if varying a quantity produces different answers to a question, then you *absolutely cannot* settle on one numerical value for that quantity.

in general, **testing only 1 value for a quantity is almost always a HORRIBLE idea on data sufficiency problems**. almost every data sufficiency problem relies on differences induced by changing the value of a quantity, and this one is no exception.

you should restrict single-number-picking to problem solving questions, on which the multiple choices guarantee that you aren't missing anything. on data sufficiency, you should *try a variety of values* and watch what happens to the quantities in the problem.

--

analogy:
what % of his original weight has dexter lost so far in 2008?
(1) dexter has lost 30 pounds so far in 2008.

here it should be fairly clear that (1) is insufficient; the higher the original weight, the lower the %. you can't just declare that dexter originally weighed 100lbs and that he has therefore lost 30% of his weight; that would be absurd.
same reasoning applies to this problem.

if the second statement had instead given a 30% increase in the each sofa's rate.. instead of $30.. can we say C would be answer for this question..

that would be correct.

in that case, let's say that "p" was the original price, and "q" the original quantity.
then last year's revenue was (p)(q)
and this year's is (1.3p)(1.1q) = 1.43pq
so that's a 43% increase

35. Something wrong with the choices.

40 percent are third-year --> 60 percent are *not* third-year.
70 percent are not second-year --> 30 percent *are* second-year.
taking the problem statement as written, then, we'd have 30/60, or 50%.

36.

FACT ABOUT WEIGHTED AVERAGES: if you have the weighted average and both endpoints, then you also have the RATIO of the weights in the problem. that ratio is the reciprocal of the ratio of the*distances* between the endpoints and the weighted average.
in this problem, we have this:
(endpoint Y 2%)-------**distance=3**-------(weighted average 5%)----------**distance=5**----------(endpoint X 10%)
so
since distance Y : distance X = 3 : 5, the ratio of the weights (literal "weights" in tons, in this problem) of Y : X must be 5 : 3.

because you have this ratio, specifying even one of the quantities is sufficient to determine *everything* - just use the ratio to figure out the rest.
therefore, either of the choices will be sufficient.

OR
You can write the equation 0.1x + .02y = .05z, but the problem gives more info than that (not just the statements - the problem itself). First, that equation tells us how much gravel G we have, right? 10% of x is a certain amount of gravel G and 2% of y is a certain amount of gravel G and so on.

Let's call x and y "inputs" and z the "mixture."

If we were to input the exact same amount of x (which is 10% gravel G) and y (which is 2% gravel G), what percentage of the resulting mixture z would be gravel G? Average 10 and 2: 6%.

If you want to prove with real numbers, take 100 grams of x (which gives us 10 grams of gravel G) and 100 grams of y (which gives us 2 grams of gravel G). The resulting mixture has 12 grams of gravel G and 200 grams of material total, or 12/200 = 6/100 = 6%.

But x and y are two different variables, so we don't input the same amount of each. The problem says the mixture percentage is 5%, not 6%, so do we input more of x or more of y in that mixture? We input more y, because the mixture percentage is closer to y's percentage than it is to x's percentage. With me so far?

the problem also gives us something about the ratio of x to y. Figure out how far away the mixture percentage is from each of the two starting percentages. 5 is three away from y's percentage of 2, and 5

is five away from x's percentage of 10. The "three away" and "five away" numbers tell us how to write the ratio. The larger number goes with the input that's contributing more; in this case, y is contributing more, so the 5 goes with the y. The smaller number goes with the input that's contributing less; in this case, x is contributing less, so the 3 goes with x. The ratio of x to y, then, is 3 to 5.

OR

10x+2y=5Z or 5(x+y)

1. y=10 sufficient to know x
2. z=(x+y)=16 sufficient to know x

Therefore, D.

37.

T = 5*(k-32)/9

290*9/5 = K - 32

58*9 + 32 = K

just calculate the unit digit:
8*9 + 2 = 4, so D is the answer.

(290* 9 / 5) + 32 = k

=> k = (290 * 10 /5) + 32

= (290 * 10 * 2 / (5*2)) + 32

= double of 290 + 32

= approx 600 but in 550 range... ;) ...so D

38.

No. of Video Cameras produced in 1993 = 1000
Assume 'a' be the increase in no. of video cameras in 1994,

So x = (a/1000)*100 or a = 10x

Similarly assume b be the increase in no. of video cameras in 1995,

So y = (b/(1000+10x))*100 or b = ((100+x)/10)*y

Now total no. of video cameras in 1995 = 1000 + a + b = 1000 + 10x + ((100+x)/10)*y...(1)

Solving (1)

10(100+x) + ((100+x)/10)*y

= (100+x)(10+y/10) = (100+x)(100+y)/10 = 10000+10(x+y) + xy/10 = 10(1000+(x+y)+xy/100)

Now statement (2) gives us the value of the expression (x+y)+xy/100. Hence it is sufficient.

one other thing about this problem:

statement (2) is WEIRD.
really weird.
so weird that it can't *possibly* be a randomly generated statement.

GUESSING GUIDELINE:
if you see a really weird, really elaborate looking statement, it's very likely to be "sufficient".
here's the rationale: if you look at statement (2) to this problem, it's clear that it has been very deliberately crafted to do ... *something*; it's obviously not a statement that has been made up at random (unlike statement (1), which could be random). most probably, that "something" will make the statement sufficient.

to see another example of "weird statements are usually sufficient", take a look at data sufficiency #120 in the 12th edition OG. or, if you have the 11th edition, look at #153.

39.
OA: E

The only way answer will be E is if there are common members in both the clubs which is not given.

40.

X + Y = 300 [since the total food is 300 g]

0.10X + 0.15Y = 38 [since the total protein is 38 g]

And you can substitute Y = 300 - X

0.10X + 0.15(300 - X) = 38
solving it you will get
X = 14

which is 10% of 300 [but 14g of protein]

SO we get 140 g of X

ADVANCED TECHNIQUE: <u>NUMBER LINE SHORTCUT</u> FOR WEIGHTED AVERAGES

if you have a WEIGHTED AVERAGE of two quantities, then you can FIGURE OUT THE RELATIVE AMOUNTS OF EACH by doing the following:
* plot the individual averages on a number line
* plot the weighted average ("WA") on the same number line
* find the distances between the individual averages and the WA
* REVERSE the ratio of these distances
that reversed ratio will be the ratio of the amounts.

in this problem:
* food X contains 10% protein

* food Y contains 15% protein
* the mixture contains 38/300 = 12 2/3 % protein

plot on a number line:
<--------X=10%----------WA=12 2/3 %----------Y=15%------->

so the distances are 2 2/3 (for X) and 2 1/3 (for Y)
the reverse ratio is X:Y = 2 1/3 : 2 2/3
which equals 7:8 (note that you can multiply by 3)

therefore the food is 7/15 "X" and 8/15 "Y".
7/15 of 300 is 140.

finally, you can **ESTIMATE**

you can notice that the final mixture is 12 2/3 % protein, which is closer to Y than to X - but BARELY so (it's almost right in the middle).

therefore, the mixture should be EVER SO SLIGHTLY MORE THAN 1/2 Y and ever so slightly LESS than 1/2 X.
the only choice that satisfies this condition is 140.

41.
OA C

[(5000000 *7.20) + (10000000*1.25)] /10000000

That should give you 4.85

Its total earnings by number of shares will give you earnings per share.

also, note that you don't have to be overly concerned with the number of 0's at the end, as the digits in the answer choices are all different. once you realize that the two terms that you're adding together will have the same number of 0's, you can just do 5x7.2 + 10x1.25 = 36 + 12.5 = 48.5. then pick the only answer choice with those digits in it.

42.

the problem is stated in terms of profit PER CRATE.
since the price of the crate is already given PER CRATE (IE $5/crate), you don't have to find the price per orange. notice that you just wind up taking this quantity and multiplying it back out by 40 again in the next step (undoing what you just did).

instead:
BUY at $5/crate
SELL at $0.20 times 40 = $8/crate
subtract = $3 profit

43.

REPEAT PROBLEM – IGNORE

44.

Each statement alone is clearly not enough... we are trying to determine if income/population > 16,500 so we need to have values for the numerator and the denominator. So it's either C or E.

(1&2) Suppose we start with the fraction $5.5B/330K. This is greater than $16,500. However, the given values are both lower limits. If we increase the numerator while keeping the denominator constant, income per capita will certainly increase. If, instead, we increase the denominator, the income per capita will decrease. A slightly larger value for the population would bring it down below $16,500. Not knowing what the upper limit for the population is what makes it insufficient.

Answer is E.

The question is asking a yes/no question: whether the income is greater than $16,500. If we can answer "yes, always" or "no, always," then the info is sufficient. If we answer "sometimes it's greater and sometimes it's lower," then the info is not sufficient. So if we can show that, in one instance, it is greater, and in another, it's not, then we know the info is not sufficient.

per capita income = total income / total number of people

Start with the two given lower limit numbers. These are the lower limits for total income and for total number of people, but putting them together does NOT necessarily equal the lower limit for per capita income.

Let's use slightly easier numbers to illustrate.
lower limit on total income = $100
lower limit on total number of people = 20

If we use these two numbers, we get a per capita income of 100/20 = $5. But $5 is NOT the lower limit for the per capita income figure.

Let's say we have the same amount of income, $100, but we have 50 people. Now the per capita income is $100/50 = $2. What is we have $100 in total income and 500 people? $100/500 = $0.20. Keep increasing the number of people and you can make the per capita income really small.

Now, let's say we have $1,000 in income but still only 20 people. Now the per capita income is $1,000/20 = $50. Keep increasing the income and you can make the per capita income really large.

So without any more info, we don't have sufficient info to say the per capita income figure is above or below some set amount, because we can create pretty much any figure we want, depending upon what we choose for our two inputs.

Basically, I can create any number I want

45.

The answer is 432

1) Solve for price:

P(.08)= (.05P)-12

P=400

2) add sales tax:

400(1.08) = 432

If we let x be the purchase price, then the tax at 8% is 0.08x, and the tax at 5% is 0.05x. That is how the first equation is set up:
0.08x = 0.05x + 12
So x = 400.

Now she paid a sales tax of 8%, which is 0.08*400 = 32, so her total price is $432.

46.

312

You Know that the total of people in the User Friendly (UF) circle is 56 and the total in the Fast Response (FR) time is 48. The overlapping area between both including the overlapping with Bargain Prices (BP) is 30. So the Min and the Max people of UF + FRT (forget about BP circle now, dont even trace it if you want) is (56-30) + (48-30) +30 = 74. (with the circle it is easy to see). Means that you have 26 persons NOT UF and NOT FRT and the remaining 16 (42-26) have to be in an Overlapping area UF-BP or FRT-BP.

Thus 26 % is the number of people citing BP but not UF and not FRT (I dont think there is a min and a max , it can only be this number.) and 26% of 1200 = 25%+ 1% = 300+12=312 (it s the way i do my calculation to go faster).

47.

I set the problem up (incorrectly):
E=2h
E=3m
Therefor 2h:3m
h/m = 3/2. Thus, the ratio is 3:2

easiest way to do this problem is to PLUG IN NUMBERS, because there are no definite quantities in the problem (all you have is ratios).

it's probably easiest to pick the number of english majors first, since that quantity is in both parts of the problem.
since that number is 3 times one quantity and 2 times another quantity, you can pick 6.

the first sentence then tells you that there are 3 history majors.
the second sentence tells you that there are 2 mathematics majors.
therefore, the desired ratio is 3:2.

48.
REPEAT – ignore

49.
(60 + 12 / 100 + 12) = 72/112 = 65% approx.

50.

OA is b

Assume 100 Employees initially
Assume cumulative salary = "S" initially

100(S) = (90) (1.1)

Solve for S

Try numbers:

BEFORE:

100 Employees
$1 salary each

Total Salary = 100 (1) = 100

AFTER:

100 (0.9) = 90 Employees

Total Salary:
there are 90 Employees each earning ten percent more than their initial salary of $1 or each earning $1.10

Total salary = 90 (1.1)=$99

RATIO to PERCENT:(after/before)*100 =
(99/100) *100 = 99%

51.

You don't know the overlap, i.e the number of folks in the drama club, who are also members of the music club and vica versa.
Take this example,
20 members of the music club - 10 are male
all those 10 are also part of the drama club,
total ## of unique members: (16+ 20) - 10 = 26
of males = 10
so % of males : 10/26 * 100

what if all members were exclusive, ie. no overlap
then % of males : 25/26 * 100

Therefore: E

52.

The best way to solve such questions is to put everything into equations. The question stem does not give us anything, but let us assume that
s - length of the shorter piece.

l - length of the longer piece.

Statement 1: l = s + 20
1 equation. 2 unknowns. Therefore statement 1 is insufficient by itself.

Statement 2: s = l/3. 3s = l.
1 equation. 2 unknowns. Therefore statement 2 is insufficient by itself.

Together: We can substitute the value of l from statement 2 into statement 1.
3s = s + 20
2s = 20
s = 10
Therefore, l = 30. And hence the answer is C - Both statements together are sufficient.

53.
The answer is C

Old machine processes 100 units of the product in 5 hrs.

Therefore, it produces 20 units per hr.

Old machine + New machine must produce 100 units in 2 hrs.
Therefore, 50 units per hr.

Since old machine produces 20 units per hr, the new machine must produce at 30 units per hr to get a total of 20+30=50 units per hr.

Well this is how I worked it.

Machine 1 Machine 2 Both machines
rate=100 x rate=100
5 2
rate= 20 rate= 50

20 + x = 50
x = 30

54.
Total ounces of food required by 24 dogs for 7 days = 10*24*7 ------- (1)
Total ounces of dog food in each case = 30*8 ---------- (2)
Therefore, Total 1/Total 2 = 7. Answer is C.

55.

Total hours worked for 50 weeks = 50*40 = 2000 hours.
Hourly rate = 20000/2000 = $10/hr
New hourly rate = $10.50

Therefore, total amount that Mark will be paid this yr = 10.50 * 2000 = $21000.

56.

this problem is also a classic C TRAP.

a **c trap** is a problem that's clearly written to be difficult, but on which both statements taken together are VERY CLEARLY sufficient.
and by VERY CLEARLY i don't mean "after i solve *this* equation, and move *that* over *there*, then ... oh yeah, my memorized rule of thumb tells me they're sufficient" - i mean it's OBVIOUS. (examples follow, for those of you who have your og's handy.)
on these problems, you can rest assured that (c) is not the answer. also, because the two statements together *are* sufficient, you can also strike answer (e).
this leaves only (a), (b), (d). and in the dream situation, in which one of the answers by itself is clearly insufficient, then you can guess that the other one must be sufficient - and you'll be right a startlingly high percentage of the time.

you should NOT use the "c trap" approach as a PRIMARY method - i'm sure that, one fine day, a difficult "c trap" problem will come along to which the answer actually *is* 'c' (although i've yet to see one) - but, rather, as an AID TO GUESSING.
still, if you get into a guessing situation, the c trap is one of the strongest weapons in your arsenal.

this problem:
* **identify the problem as a c trap**: if you take the two statements together, then you have the prices of ALL the items in the problem. if that's the case, then the answer to the prompt question is clearly either "yes" or "no"; hence, sufficient.
kill (c) and (e) and narrow the choices to (a), (b), and (d).

* statement (2) is insufficient. this isn't ridiculously obvious, but the presence of two remaining unknowns should convince you (remember that you're in guessing mode here).
kill (b) and (d).

answer = a.

It is easy to prove that statement A is alone sufficient. Lets assume that the items cost x, y and z. In statement A, we are given that x = 50 and y = 20. So, the total discount = (10 + 2 + 0.1z) = 12 + 0.1z. where the original total cost = (50 + 20 + z) = 70 + z

Hence avg. discount = (12 + 0.1z) * 100 / (70 + z) = 100 * { [(7 + 0.1z)/(70+z)] + [5 / (70+z)] }
= 100 * [0.1 + 5/(70+z)]
= 10 + 500/(70+z)

But since z is the least expensive item, z must be less than 20 and greater than 0.
Hence for z = 0 , avg discount = 17.14% and for z = 20, avg. disc = 15.55% Hence in all situations avg. disc is greater than 15%.

Now lets test for statement B along. Here by the same logic given above,
Avg. discount = 100 * (0.2x + 0.1y + 1.5) / (x + y + 15)
Since z = 15, both x and y must be greater than 15
Lets consider three different cases -
Case 1:
If both x = y = 15, avg. disc = 600/45 = 13.33%

Case 2:
If x = y = 1000,000 avg. disc = 30000150/2000015 = 14.999%
Note: When both x and y are sufficiently large and almost equal, the avg. discount tends to the ratio of 3/20 = 15%

Case 3:
If x = 1000,000 and y = 1000, avg disc = (200,000 + 100 + 1.5)*100/1001001.5 = 20010150/1001001.5 = 19.99%
Note: If x is a very high value and y is comparitively low, the ratio would tend to become 20%

Hence the value varies from 13.33% to nearly 20%. Hence statement B alone is not sufficient.

Hence the correct answer is A.

A = Most Expensive
B = Less expensive than A
C = Less expensive than A (could be same price as B, info does not specify)

From stem: Is .20A + .10B + .10C > .15(A + B + C) ?

(1) .20(50) + .10(20) + .10C > .15(50+20+C) ?

We know that C has to be anywhere from ($0 - $20)

So test out some numbers within that range. For example if C = $20, we get .20(50) + .10(20) + .10(20) > .15(50+20+20)
= $14 > $13.50 and if continue to test numbers less than $20 this will still apply.

So (1) is suff

(2) .20(A) + .10(B) + .10(15) > .15(A+B+15)

Clearly we need more info to derive an answer so Insuff.

Answer = A

From the question, Let I1 > I2, I3 where I1 is the most expensive item and I1 and I2 be the least expensive ones.

After, 20% off on I1 and 10% off on I2, I3, their prices reduce to .8I1, .9I2 and .9I3 respectively

Now converting the wording in the question to mathematical expression we need to find - >

.2I1 + .10I2 + .10I3 > .15(I1 + I2 +i3)

solving, we get **I1 > I2 + I3** (This is actually the question.....we need to determine)

1) I1 =50 and I2 or I3 = 20, therefore if I2 or I3 =20 (the 2nd expensive one), the least expensive cannot be more than 20
so A answers the question...as **YES**

2) is insufficient as it only tells about one number.

57.

C

takeaway:
when you combine 2 ratios to make a larger ratio, use the LEAST COMMON MULTIPLE of the two numbers you're trying to merge.

in this case, you're trying to merge the numbers for "children". the original numbers for children are 2 (because 10:4 reduces to 5:2) and 10, and therefore have a least common multiple of 10.
all you have to do is multiply 5:2 by 5 to give 25:10, whereupon it combines instantly with the other given ratio.

i find it interesting that these ratios were apparently given in non-reduced form; that's somewhat uncharacteristic of the gmat writers. are you sure that statement (2) wasn't given as 5:11?

Ratio of women (W) to children (C) is 10:4 or 5:2

(1) this only gives a ratio, and the prompt only provides a ratio. With only ratios, there is no way to determine the actual # of men. INSUFFICIENT.

(2) this provides the actual number of women on the tour, but combined with the prompt provides no info on the # of men. INSUFFICIENT.

(1) && (2) since we know that the ratio of W:C is 5:2, W must be a multiple of 5, and C must be even. Let's try the first number under 30 that's a multiple of 5: 25.
W=25, then C=10, then M=22
Let's try another
W=20, then C=8, then M=not a whole number. From this we can tell that M must be a multiple of 22 and C must be a multiple of 10. We can't reduce C:M to 5:11 because the prompt states that C must be even. W=25, C=10, and M=22 is the only combination that works for W<30. SUFFICIENT.

58.

there are definitely problems that are difficult to interpret. in fact, there are a couple that are genuinely ambiguous, requiring you to rely on "convention" to interpret them correctly. i can post an example or two of those, if you'd like, on this thread. just reply and let me know.

this problem, though, is not one of those. there are two clear indicators that we're talking about an increase in S + B, and not about separate increases in the two quantities; one of those indicators is very plain, while the other is somewhat subtle.

the blue "TOTAL" should tell you at once that you're talking about ... a total. not two separate components.

the other word is more subtle, but it communicates the same fact: it uses the singular term "number". if we were talking about two separate increases in two separate quantities, the word would have to be plural "numbers".

There is not a particularly useful rephrase of this question, although it would help to assign some variables. I think it makes sense to preview the statements; at least they tell us what variables we will need to define. So, if we call S the number of shares of stock and B the number of shares of bonds, the problem really is:

"Did S increase?"
(1) S/(S + B) increased.
(2) S + B increased.

Statement (1) is testing a ratio or fraction property: what happens as we vary the numerator and the denominator relative to each other? what are the ways a fraction would increase?

There are several approaches that would work:
a) List all 9 (=3^2) of the increase/decrease/no change scenarios for the variables S and B in a chart, then use the statements to include or exclude the scenarios.
b) Use the statements to list increase/decrease/no change possibilities for S.
c) Try numbers.
d) Some combination of the above.

Statement (2) is easier, so using the BD/ACE grid makes sense.

(2) INSUFFICIENT:
S + B could increase a number of ways:
S increase, B increase,
S no change, B increase,
S decrease, B increase (more so),
etc.
Probably no need to pick numbers here, although you could if you wanted to verify.

(1) INSUFFICIENT: The best way to interpret this ratio is to rely on fraction property rules to simplify. Note that S and B are non-negative. If the positive value X increases, then 1/X decreases. So if S/(S + B) increased, then (S + B)/S decreased. (S + B)/S = 1 + B/S, so we can conclude that B/S decreased.

B/S could decrease a number of ways:
S increase, B decrease,
S no change, B decrease,
S decrease, B decrease (more so),
etc.

But, I have to admit that I might just pick some numbers to see what could happen.

Let's say that S = 10 and B = 20 at the beginning, so our original S/(S + B) = 10/(10 + 20) = 10/30 = 1/3. It's best to try to prove insufficiency, which means we should try to make this ratio increase by both increasing S and not increasing S.

The ratio could increase if we increase S:
S increases to 12, B stays at 20, so the new S/(S + B) = 12/(12 + 20) = 12/32 > 1/3.

The ratio could increase if we don't increase S:
S stays at 10, B decreases to 2, so the new S/(S + B) = 10/(10 + 2) = 10/12 = 5/6 > 1/3.

S could either increase or not.

(1) and (2) SUFFICIENT: Note that in order for the fraction S/(S + B) to increase as its denominator (S + B) increased, the numerator S must have increased, too.

59.

the point of this problem is more what NOT to do. i.e., you don't concentrate at all on the ingredient that you're getting *more* of, and you definitely don't add the 3 and 7 percent figures together.

by the way, the word "approximately" is a giveaway that you're NOT going to get an exact number. i have NEVER seen a problem whose problem statement said "approximately" but whose answer wound up in exact form.
this observation should cast additional doubt on some wrong answers.
for instance, (c) is what you get if you add the 7 and 3, and then divide 100 by *that* figure. the problem (aside from the fact that it's incorrect, of course) is that you get *exactly* 10 from that; since the problem says "approximately", you should be suspicious.

--

if you still don't understand, try an *analogy*.

let's say that granola bars come in bulk packs of 7 chocolate chip and 3 oatmeal raisin, and that you can't buy the flavors separately.

you need 100 chocolate chip and 100 oatmeal raisin bars for a catering event.

how many bulk packs do you have to buy?

same deal - you have to buy enough bulk packs to get 100 of BOTH kinds, which means you have to buy 33 1/3 of them (i.e., buy 34 of them) to get enough of the oatmeal raisin kind.
true, you'll have a whole lot of chocolate chip bars just sitting around, but that is irrelevant.

A good way to approach this one is to say, "Ok, I need 100 grams of Vit. A, and 100 of Vit. E. How much of this stuff do I need to eat to get there?" Since one gram of the stuff contains 7 grams of E (7% of 100) and 3 grams of A (3% of 100), we know that we only need to focus on Vitamin A, because once we get our necessary amount if it, we'll also have Vitamin E covered (doesn't work the other way). So, we just need to focus on getting 100 grams of vitamin A. If one serving gives us 3 grams, how many servings do you need to get to 100?

correct. so basically you just divide 100 by 3, arriving at 33 1/3, so (e) is the correct answer.

60.

Answer is C.

there are eight subsets:
none
E only

G only
S only
ES
EG
GS
EGS

let's fill in the list with the information that we already have from the problem:

none = 20 (from statement 2)
E only = 60 (from statement 1)
G only = 0 (because they all speak english too)
S only = 70 (given)
ES = _____
EG = _____
GS = _____
EGS = 0 (given)

the only blanks combine to give the desired quantity. we can't find the values of the individual blanks, but we don't care; all that matters is their sum, which is easily found by subtracting 20, 60, and 70 (as well as the two 0's, if you want) from the total of 200. there's no need to perform this calculation, because it's data sufficiency and we know there's going to be a unique numerical answer.

ans = c

61.

We need service error rate/100 customers in Division B. To calculate the rate we need two things: -

1) No. of customer in Div B in 1995
2) Service errors in B in 1995

From question stem we know the no. of customers in Div A(4850) and no. of service errors(86) in Div A

Statement (1) - Gives overall service error rate i.e. 1.5/100 customers. But it doesn't give any information about no. of customers in Div B. Hence insufficient.

Statement (2) - Gives no. of customers in Div B (9850). From question stem and (2) we know the total no. of customers in A & B also the no. of service errors in A. Still service errros in B is missing. Hence insufficient

Combine (1) & (2)

We get total service error rate for A & B, also we know the total no. of customers and no. of service errors in Div A

Hence no. of service errors and service error rate/100 customers in Div B can be calculated.

QUESTION

can i potentially solve this wtd average problem as follows (i'd like to know if this is correct):

86(4850/14200)+x(9350/14200) = 1.5

Please tell me if the above equation is correct. x is the service errors for Division B and 14200 is the combined number of both Divs A + Divs B.

ANSWER

no, you can't do that.

the left-hand side of this equation is set up as a 'weighted average' of 86 and x, weighted by the numbers of customers - an average that doesn't make sense in the first place, given that 86 and x are *aggregate totals*(it doesn't make any sense to average aggregate totals - the things for which weighted averages make sense are individual data points, such as test scores or temperatures). moreover, the things you're trying to average on the left side aren't parallel to the right-hand quantity, which is a *rate* per 100 customers rather than an aggregate total.

see the posts above for what you actually *can* do on this problem.

Here, in this problem, why wouldn't the combined error rate simply be the combination of the individual error rates, described as #errors/customer?

the problem here is that your question is too vague. notice that you're using the word "combination". you may or may not be doing this on purpose, but, essentially, you're saying "combination" (a vague word that can mean a number of different things) so that you don't have to commit yourself to a more narrowly defined word, such as "sum".

unfortunately, *not all rates "combine" in the same way.*

for instance, SOME rates are additive. for instance, if machine A burns 5 discs per hour and machine B burns 10 discs per hour, then the two machines working together burn 5 + 10 = 15 discs per hour. on the other hand, OTHER rates may not necessarily be additive. for instance, if machine A burns 5 discs per hour on the day shift and 10 discs per hour on the night shift, then machine A's rate for the whole period is somewhere *between* 5 and 10 discs per hour (depending on the lengths of the two shifts). nothing in this problem is 5 + 10 = 15 discs/hour. (this is closer to what's happening in the posted problem.)

you have to use the context of the problem to find out *exactly* what "combine the rates" means in each case. they don't all fit the same mold.

From Statement (1)

(86 + x) / (4850 + B) = 1.5 / 100

Where x = errors in Division B, B = customers in B.

Not Sufficient.

Is the above equation right?

From Statement (2)

We get B. Not Sufficient.

(1) + (2)

x is the only unknown. We can find x and later service errors per 100 customers.
if we calculate further we get x=127

hence OA-C?

62.

A ratio tells us the relative amounts of something but not the absolute amounts. Since they're asking for a ratio, we only need to know how much Robert packs relative to Pat - we don't necessarily need to know their exact, actual amounts. The ratio, however must be constant - that is, I have to find one definitive ratio.

Statement 1 tells us that Linda packed 30% relative to the others. The others, therefore, combined to pack 70%. This doesn't let us know what Robert packed relative to Pat, though. Not sufficient; eliminate A and D.

Statement 2 tells us that Robert packed 10 boxes more than Pat. This tells us a relative amount but is not sufficient to calculate a single, constant ratio. For example, Robert could have packed 20 to Pat's 10, for a ratio of 20:10 or 2:1. Or Robert could have packed 30 to Pat's 20, for a ratio of 30:20, or 3:2. Those are different ratios, so not sufficient. Eliminate B.

Combining the statements: If the boxes total 100, then according to the first statement, L packed 30 and R+P packed 70. The second statement means that R packed 40 and P packed 30, for a ratio of 40:30 or 4:3. If the boxes total 20, then L packed 4 and R+P packed 16. In this case, R packed 13 and P packed 3, for a ratio of 13:3, which can't be simplified. Those are different ratios, so not sufficient. Eliminate C. (Note: you can pick any numbers you want to test this, so use numbers that are easy for you.)

Answer is E.

63.

the correct answer is E

first off, the problem statement MUST say "1.5 times **AS FAST**".
this is not the same thing as "1.5 times *faster*", which actually means 1 + 1.5 = 2.5 times *as fast*.

is this what the problem statement says?

i'm sure it is, since the gmat wouldn't allow such a grievous mistake.

make sure that you know the basics of how to handle RATES here.

you can't use the given "4" as is; you have to convert it to a RATE, since we're talking about a RATE that it 1.5 times another RATE.

this is a rate of 1 pool filled in 4 hours, or 1/4 pool per hour.

therefore, if x is the rate of the slower pump, we have 1.5x = the rate of the faster pump. (despite the fact that we are ultimately interested in the rate of the faster pump, this is the easiest way to define the

variables.)
thus x + 1.5x = 1/4.
2.5x = 1/4.
multiply by 4 to give 10x = 1 .
x = 1/10.

the value in which we are interested is 1.5x, which is (1.5)(1/10), or (3/2)(1/10), or 3/20.

the TIME taken to fill the pool is the reciprocal of the rate, or 20/3 hours. alternatively, you can solve the equation R x T = W, with R = 3/20 pools per hour and W = 1 pool. you'll get T = 20/3 hours.

Let's say the capacity of tank is 100 ltr.

Pipe A and Pipe B, both work together and fill 100 leters of water in 4hrs.

As per the question, One pipe is 1.5 faster than the other pipe.

So I suppose, A is 1.5 faster than B.

A=1.5B; A:B = 3:2

The rate of work for A and B is 3 and 2.

How much pipe A filled? 3/5(100) = 60 liters.
How much pipe B filled? 2/5(100) = 40 liters.

So which pipe is faster? pipe A or pipe B?

Definitely A, because pipe A is filling 60 liters of water in 4 hrs where as pipe B is filling 40 liters of water in 4 hrs.

So how many hours pipe A takes to fill entire tank (capacity of 100 liters)?

Pipe A takes 4 hrs to fill 60 ltr.
In 1 hr, Pipe A fills 60/4 =15 lts.

Conclusion: Pipe A fills 15 ltrs of water every hour.

How much time pipe A (faster pipe) will take to fill 100 lts?

100/15 = 20/3.

64.

Answer is C.

you can solve these by reading the incomes off the graph. for each year, the income is the y-value for that year.

(i)
the income for 1985 is about $25,000.
the income for 1995 is over $60,000, which is well over twice $25,000.
so, this statement is true.

(ii)
the income for 1985 is about $25,000.
the income for 1990 is between $35,000 and $40,000, closer to $40,000. let's say $38,000.
the income for 1995 is between $60,000 and $65,000, closer to $65,000. let's say $63,000.
the increase from '85 to '90 is about $13,000; the increase from '90 to '95 is about $25,000. there is no question that the second is greater.
thus, statement (ii) is false.

(iii)
this problem is the time-suck; the easiest way to do it is to add all the incomes together and divide by eleven (the total number of years for which income is shown).
let's estimate (in thousands - i'm not going to type all the ",000"s, and you shouldn't write them on test day either):
(25 + 26 + 26 + 35 + 36 + 38 + 38 + 57 + 63 + 63 + 63) / 11
= 470/11
= comfortably greater than 40 (it's 42 and change)
so, this statement is true.

65.

i'm assuming this is a paraphrase of the actual problem (which is fine), but next time please try to copy the problem verbatim. this problem doesn't seem to have any subtleties, but some problems feature subtleties that might be lost if you don't copy the problem word for word.

--

statement (1) is the easier statement: if all you know is that she bought 6 pencils, you of course have no idea how many of those 6 were of each type. this statement is therefore insufficient.

statement (2):
you have 21x + 23y = 130. because that's one equation in two variables, your first instinct is probably to say 'insufficient!!'
the problem here, though, is that this equation must have solutions that are **nonnegative integers** (and is therefore called a 'diophantine equation', if you like mathematical terms). because of that restriction, it's quite possible that there's only one feasible solution; the only way to find out within a reasonable amount of time is to exhaust the possibilities:
let 'C' stand for the cheap pencil, and 'E' for the expensive one.
buy NO C's: could spend 0, 23, 46, 69, 92, 115, 138, ... (no 130)
buy ONE C: could spend 21, 44, 67, 90, 113, 136, ... (no 130)
buy TWO C's: could spend 42, 65, 88, 111, 134, ... (no 130)
buy THREE C's: could spend 63, 86, 109, 132, ... (no 130)
buy FOUR C's: could spend 84, 107, **130** (aha)
buy FIVE C's: could spend 105, 128 ... (no 130)
buy SIX C's: could spend 126, ... (no 130)
if you buy seven or more C's, you've already spent more than 130.
only one possibility works
sufficient

answer = b

66.

OA is E
Let x and y represent the respective rates of X and Y.
We must know the values of both x and y to know "how many more hours". In other words, y = 2x does not tell us how many more hours the job takes Y than X, only that Y takes twice as long. If x = 2, y = 4 and the difference is 2. However, if x = 3, y = 6, and it now takes 3 hours longer.

1) 1/x + 1/y = 1/T
So, T (total time) = xy / (x+y)
Statement 1 tells us that the total time or combined = 2/3 x
So, xy / (x+y) = 2/3 x
Solve and you get y = 2x
INSUFFICIENT – again, it only gives us a relationship

2) translated gives y = 2x

Statements 1 and 2 provide the same information, so either D or E
Since we cannot combine 2 similar equations to solve for 2 variables, the answer is E

67.

probably the most efficient way to solve this one is with the concept of *relative rates*.

start at the time when the cyclist passes the hiker.
since they're both traveling in the same direction, their *relative* rate - i.e., the rate at which the distance *between them* is changing - is found by subtraction. so, as long as they're both moving the cyclist is gaining on the hiker at a rate of 20 - 4 = 16 mph.
after the cyclist stops, the hiker is making up that distance at a rate of 4 mph. that's only 1/4 as fast as the relative rate during the first 5 minutes, so it will take the hiker 4 times as long to catch back up. so, 4 x 5 = 20 minutes.

if you wanted to, you could calculate the actual distance between the cyclist and the hiker when the cyclist stops: (16 mi/h)(1/12 h) = d, where "1/12 h" is five minutes. then you could find the time taken by the hiker alone to travel the same distance "d".
you don't have to do this, though, if you realize the 1:4 ratio referenced above.

Hello, I am having problems understanding how to complete this problem. I get a totally different answer.

OR

For this problem, we use the d = r*t formula

Hiker distance after 5 minutes
r = 4 miles / 1 hour -> 4 miles / 60 minutes -> 1 mile / 15 minutes
t = 5 minutes
d = r*t -> 1/15 * 5 = 1/3 miles

Cyclist distance after 5 minutes
r = 20 miles / 1 hour -> 20 miles / 60 minutes -> 1 mile / 3 minutes
t = 5 minutes
d = r*t -> 1/3 * 5 = 5/3 miles

Distance between the two after 5 minutes

5/3 - 1/3 = 4/3 miles

Time it takes Hiker to travel 4/3 miles
4/3 = 1/15 * t
t = 20 minutes

OR

after the cyclist passes the pedestrian, their ***relative* rate** is 16 miles/hr (20 - 4, since they're traveling in the same direction): in other words, the cyclist is going to get 16 miles farther ahead of the pedestrian each hour. so, in five minutes, which is 1/12 hour, the cyclist will go (16 mi/hr)(1/12 hr) = 4/3 miles ahead of the pedestrian.

then, the cyclist must wait for the pedestrian to walk 4/3 mile. this takes t = d / r = (4/3 mi) / (4 mi/hr) = 1/3 hr = 20 minutes.

68.

$240

well, with a problem like this, one of the easiest ways to get the solution is by PLUGGING IN THE ANSWER CHOICES and WORKING BACKWARDS.

since the only answer choice you supplied is the correct answer, we'll work with that one, and show you how the solution proceeds.

you take the given value for january and input it into the given ratio of 3 : 2 to find the bill for february. either by using a proportion (x/240 = 3/2) or just by inspection ("hey, they're multiplying by 120"), you find that the bill for january is $360.
now you check the hypothetical: add $40 to the february bill, producing $400. CHECK this ratio against what's*supposed* to happen: 400/240 = 5/3, as required. this means that you have the correct answer; if you'd chosen one of the incorrect answers, then you'd get something other than the desired 5/3 ratio once you'd worked out the whole problem.

--

algebraically:

the openers for this problem are AUTOMATIC; you should have no trouble generating them. if you've practiced ratios enough, this sort of problem should be completely routine.

OPENER #1: IF YOU HAVE A RATIO OF TWO TOTALLY UNKNOWN QUANTITIES, USE THE "X" MULTIPLIER:
the first thing you're told is that february and january are in a ratio of 3:2. therefore, call them "3x" (february) and "2x" (january). *do not* use two variables, as getting rid of one of them will simply be a waste of time.

OPENER #2: IF YOU ALREADY HAVE ALGEBRAIC EXPRESSIONS, SET UP A PROPORTION:
once you have the 3x and the 2x, do what you're told, and add $40 to the 3x (the hypothetical situation described in the problem).
the new, hypothetical february quantity is 3x + 40, while january is still 2x.

therefore, set up the proportion:
(3x + 40) / 2x = 5 / 3
cross-multiply: 9x + 120 = 10x
120 = x
january = 2x = 240

69.

1. Pie walked 6.4 km/hr, and 1mile - 1.6 km, so I coverted 6.4 km/hr to m/hr by dividing 6.4/1.6 = 4 m/hr.
so stem-1 is sufficient to answer the question ..it would take more than two hours to travel 10 miles.

2. pie takes more than 9 minutes to travel 1 km, so I took next least possible time (i.e 10 mins), so if a person travels 1 km in 10 mins then he would travel not less than 6 km/hr. Convert 6 km/hr to m/hr by dividing 6/1.6 = 4.25 m/hr. so again it would take more than 2 hours to travel 10 miles..

the answer is D - both are sufficient.

the longer you take, the *slower* your rate. if you're confused as to which way the inequality goes, just think about whether the answer would be 'yes' or 'no' if r were (a) 0.00001 miles/hr or (b) 1,000,000 miles/hr.

ironically, you would be fine with this misinterpretation of the problem statement, because it's data sufficiency; "is x true" and "is x not true" are indistinguishable in the weird wild world of DS.
for all you logic hounds out there, yes, the exact opposite of $x < 5$ is not $x > 5$ but rather $x \geq 5$, but this is a non-issue because neither of the statements has anything to do with r = 5.

--

if you're overly confused by the inequality signs, just practice the following templates until you've got them totally down cold:

is x > 20?
(1) x > 18
(2) x > 21
answer: (b) - 2 is sufficient, 1 isn't

is x > 20?
(1) x < 18
(2) x < 21
answer: (a) - 1 is sufficient, 2 isn't

etc.

70.

ANS:-B

(1)
if you have "so-and-so-many-% of *X* are *Y*", this serves *only* to elucidate the relationship between *X* and *Y*. here, those two quantities are the total population of the country ("*X*") and the total of all 65+ year olds ("*Y*").
the problem statement is asking you for a percentage **OF** the 65+ year olds, so this statement is

completely useless (it doesn't fragment the 65+ year old population at all in any way).
insufficient.
very insufficient, if i may say so.

(2)
if you like classifying problems, you can recognize this as part of a *weighted average* setup.

facts:

* the weighted average MUST lie somewhere from 10% (which would be the "average" if *everyone* 65+ years old were female) to 20% (which would be the "average" if *everyone* in that demographic were male). note that this fact is sufficient to answer the problem, since all the possibilities are at least 10%. this should also be intuitive: you can't have an overall percentage that's less than that of any component! think how absurd it would be if, say, 40% of men and 55% of women voted for some presidential candidate, but that candidate only captured 30% of the overall vote. that's clearly impossible (unless there are other voters besides men and women, like, say, robots).

* you can't *determine* the weighted average, because you don't know the relative numbers of men and women in the 65+ population. you'd need that **ratio** to determine the weighted average, though you don't need the actual numbers. the higher the ratio of men to women, the closer the number is to 20%.

this statement is sufficient.

Statement 1 - gives percent of people in the age group, but there is no mention of employment figures. Not sufficient

Statement 2 - it gives the percent of men (20%) and women (10%) over 65 years AND who are employed. The total number of men and women in this age group is not given. let us assume it is denoted by M and W. hence the total figure is

$$\frac{(\ 20\ \%\ \text{of}\ M + 10\ \%\ \text{of}\ W\ )}{(\ M + W\ )}$$

this gives a weighted average whose value will always be greater than 10 and less than 20.

So infact M and W is not required to answer the solution.

71.

try (a):
new # of employees = 800 - 200 = 600
new # of long-term employees = 560 - 200 = 360
% = 360/600 = 60%

The key here is to remember is that when a certain number DO retire, that will make the ABSOLUTE number of total employees less--that is what is throwing you. So take each of the answer choices and subtract them from the original number , 560 long-term employees (that is 70% of the original 800). Aha--but whatever number you choose, remember that the total number of employees will be reduced as well--whatever long term employees are left will NOT be out of the original 800, but out of whatever is left! Try that and see which answer choice gives you 60% of what number is left.

the first step of the problem, of course, is to calculate 70% of 800, which is 560.

after you do this, the algebra isn't really that bad. you just have to realize that the number of employees who retire (call this *x*) must be subtracted from BOTH the 800 and the 560.

after you take away x employees:
total # employees = 800 - x
# of long-term employees = 560 - x

so, set up a proportion: (560 - x) / (800 - x) = 3 / 5
(note that 3/5 is the reduced version of the 60% percentage)

cross-multiply to solve: 2800 - 5x = 2400 - 3x
400 = 2x
200 = x

72.

the car has traveled 50*5=250 miles * 1 gallon gas/30 miles = 25/3. When you divide it by 12 again, you get 25 / 36.

NEVER approximate ANYTHING unless the answer choices are fairly far apart. when the answers are as close together as 2/3 and 25/36 (which are very close together indeed), the difference between the approximation and the true value could mean the difference between the right answer and the wrong answer.

73.

OA: C

(1) alone:
since total cost = L + M, this means that L + M = 3M, or L = 2M.
so, rephrased, statement 1 says that **labor cost twice as much as materials**.
still, this is insufficient, as picking values will show: if M = $1 and L = $2, the answer is yes, but if M = $150,000 and L = $300,000, the answer is no.

(2) alone:
great, but no information at all about materials. so, if L = M = $1, then yes; if L = $1 and M = $499,997 (so that profit = $2), then no.
insufficient

together:
we have
P > L
which, using the rephrasing found above, rephrases to
P > 2M
also,
P = 500,000 - 3M (because total cost = 3M)
so
500,000 - 3M > 2M

500,000 > 5M
100,000 > M
since M is less than 100,000, it follows that profit, which is 500,000 - 3M, must be more than 500,000 - 3(100,000) = 200,000.
answer = yes
sufficient

remember: profit = revenue - cost
(this is the *only* thing you'll *ever* have to know on the gmat that pertains even remotely to business)
the whole point of statement (1) is that you have no actual dollar value for the total cost. if you had a concrete dollar value - *any* dollar value, regardless of the actual amount - you'd be able to calculate the profit.

74.

in order to **combine ratios**, you should **multiply them so that the COMMON TERM has the SAME COEFFICIENT** in both ratios.

here, we have:
history : english = 1 : 2
english : mathematics = 3 : 1
the common term is "english", but the coefficients don't match: one of them is 2, and the other is 3.
therefore, multiply the first ratio by 3 on both sides, and multiply the second ratio by 2 on both sides.
therefore:
history : english = 3 : 6
english : mathematics = 6 : 2
you can then combine the ratios:
history : english : mathematics = 3 : 6 : 2
therefore, history : mathematics = 3 : 2.
ans = (b)

--

you can also PICK NUMBERS on this problem.
there are twice as many english majors as history majors, so let's arbitrarily say that there are 60 english majors and 30 history majors.
there are 3 times as many english majors as math majors, and we've already decided that there are 60 english majors, so there must be 20 mathematics majors.
therefore, history : mathematics = 30 : 20 = 3 : 2.
ans = (b).

75.

OA is D

If you approach this sequentially, it will just fall into place.
Cost per paying person if everyone had paid their share = Total Cost / Number of ppl i.e. x/T

Cost per paying person when S ppl dont pay => Number of ppl paying is T-S. Hence cost per paying person = x/(T-S). Also note this will be a larger amount than the one above (x/T).

Hence, the difference (additional amount everyone has to pay) is
x/(T-S) - x/T = xS/(T(T-S)) ie D

77.

given a distance d, xd/100 miles at 40 mph and (100d-xd)/100 miles at 60 mph

Total time = xd/4000 + (100d-xd)/6000 = d(x+200)/12000

Average speed= d/(d(x+200)/12000)= 12000/(x+200)

WE could reason that if x=0, the answer must be 60 and get C as the answer

that isn't cheating at all. that's an astute application of "plugging in numbers" / "VIC method", a perfectly legitimate problem-solving method.

in fact, any competent GMAT taker should include such methods as *automatic backups* in case they don't come up with "textbook" solutions to problems like these *right away*. these methods enable you to "solve" problems that you don't know how to solve the regular way.

77.

best way to solve problems like this one - in which there are UNDETERMINED VARIABLES (meaning that not only are they unknown, but you actually CAN'T find specific values for them) - is to plug in sample numbers for the variables, and solve the problem with the more specific numbers in place.

so:
try x = 2
then we have 2 meters per second
which is 2 * 3600 = 7200 meters per hour (since there are 3600 seconds in an hour)
which is 7200 / 1000 = 7.2 kilometers per hour (since there are 1000 meters in a kilometer)
therefore:
if x = 2, then y = 7.2

now all you have to do is plug x = 2 into the answer choices, and see which of the choices gives 7.2.
a = 10/18
b = 12/5
c = 36/5 **= 7.2**
d = 120
e = 5,200,000

therefore, answer = c

78.

(c).

statement (1):
you've got the target for december. therefore, **if** you had any information about the monthly progression of the target, you'd be able to count backwards, month by month, to arrive at the figure for march. unfortunately, you have no such information. therefore, we have no way of knowing definite revenue-target figures for any month except december.
insufficient.

statement (2):
this information is good enough for us to know everything about the monthly progression of the revenue target. specifically, we know that it grows by $30,000 over three months (from june to september); therefore, *the revenue target grows by $10,000 per month*.
unfortunately, that's all we know; this isn't enough information to arrive at any definite figure, since we have no actual numbers from which to subtract, or to which to add, this $10,000 per month.
insufficient.

together:
the december revenue target is $310,000, and the target grows by exactly $10,000 per month.
therefore, we can count back by $10,000 per month until we get the figure for march. (note: no need to actually do this)
sufficient.

ans = (c)

79.

Answer: (D) 40% increase

The best way to deal with questions like this is to convert the statement to an equation. In this problem the rate of the reaction can be represented as

(Square of A) divided by B, where A and B represents the concentration of A and B respectively. The reason why we say "divided by B" is because the rate is inversely proportional.

So when we increase the concentration of B by 100%, B will become 2B.

So the new rate of the reaction is (Square of A) divided by 2B

Now in order to keep the rate of reaction the same, the numerator should be multiplied by 2. We can achieve that by increasing the concentration of A to "SquareRoot(2) times A". Square Root of A is approximately 1.41. So that means we need to increase the concentration of A to 1.41A or increase by approximately 41%. The closest answer is (D).

step1: ratio should be constant
step2: the denominator increased by 2 times - hence numerator should also increase by the same amt.
step3: since the numerator has to increase in squared terms- ((sqrt 2)*A)^2 gives the right increase.
step4: sqrt 2= 1.414, i.e. 40% increase.

If you want more proof, though, you could do this: Replace B with 2B (we doubled it's concentration). Replace A with xA (we want to know what to do to A's concentration). The rate should stay the same.

r = original rate = rate after changes
r = A^2/B = (xA)^2/(2B)
A^2/B = (x^2)(A^2)/(2)(B)
1 = [(x^2)(A^2)/(2)(B)] * [B/A^2]
1 = x^2/2 (the A^2's and the B's cancelled)
x^2 = 2
x = 1.4

1.4A indicates a 40% increase in A's concentration.

80.

if you know that formula, just plug into it.
for onlookers:
"ABI" is, basically, "everyone total".
"a" is "has tv"
"b" is "has car"
"i" is "has neither"
"ab" is "has both"

by the way, this is a prime illustration of why using the double-set matrix is better than using formulas. we have a user who knows the formula cold but is STILL confused by it; that will not happen with the double set matrix.

you're looking for "i" (in your terms).

using your formula,
3000 = 2980 + 2970 + i - "ab"

the problem is, you don't know "ab" (the number who have both). this number could range anywhere from 2950 to 2970, but it's sufficient just to realize that it can have more than one value.
since i depends on ab, INSUFFICIENT.

--

this problem is easier to visualize with the double set matrix.

81.

OA C

I could go as far as,

Base = 15x = 30

x = 2

Initial quantities:

A:B:W = 8:30:40

Also, since the ratio of Acid to water remains same"

Previous Ratio (A1 :W1) = New Ratio (A2:W2)
W2 = 15

the solution above works wonderfully.

here's another, more abstract solution. it's more conceptually difficult, but it's faster.

1) realize that you're going to have to add both water and acid (this is the only way that you can keep that ratio constant). you could also attain the requisite ratios by removing base, but that option isn't permitted.

2) the current ratio of acid:base is 4:15 (grrr...). you want it to be 9:15. *this means that you need to add 5/4 as much acid as is already in there*, since you need to turn the ratio coefficient of "4" into a "9". note that it's not necessary to calculate the actual *amount* of acid.

3) you have to *increase the water in exactly the same proportion*.
there are 40 ml of water, as calculated above (you do have to figure this out, still).
therefore, you need to add (5/4)(40), or 50 ml of water.

if you have any trouble following this explanation, you should immediately change over to the explanation(s) above, in which you calculate the specific numbers involved.

82.

here's the deal:
background fact: if you have two things doing the same work at the same rate, then they can do it in half the time. <-- this fact is all you need to understand the following explanation.

the faster leak takes C hours and the slower leak takes H hours.

* if both buckets were as fast as the fast one, then they would take C/2 hours.
--- but they aren't, so they take longer than that.
* if both buckets were as slow as the slow one, then they would take H/2 hours.
--- but they aren't, so they're faster than that.

done.

You can also see it algebraically:

$c/2 < ch/(c+h)$

$1/2 < h/(c+h)$

if $c<h$, then this must always be true since$c+h<2h$.

so I and III must always be true and the answer is E.

If you're quick and confident with the algebra you can answer this question definitively though. When the two taps are filling bucket together:

$1/t = 1/c + 1/h$
$1/t = (c+h)/ch$
$t=ch/(c+h)$

Let's consider the right side of inequality III ($t < h/2$). Substiture the expression for t above:

$ch/(c+h)<h/2$

$c/(c+h)<1/2$

is this always true when c<h? It sure is, since c+h must be greater than 2c.

As for the left side of the inequality (c/2 <t) you can see that this is true intuitively by noting that since h takes longer to fill the bucket by itself than c, it can't cut c's time in half when they are working together.

83.

This is an estimation problem, you don't need to know precise values for the cube and fourth root of 4 - you just need to realize that they are each between 1 and 2. Here's why: The square root of 4 is 2. So clearly the cube and fourth root must be smaller than the square root, i.e. less than 2. However they must be greater than 1 - positive numbers less than 1 (say .75) get smaller as they are multiplied together and you need to "build-up" to 4.

So then you're left with sqrrt(4)+cubert(4)+4throot(4) = 2 + something between 1 and 2+ somthing between 1 and 2 so it must be greater than 4.

when you have an OPERATOR SYMBOL, such as "√", that symbol will produce exactly ONE value.

for instance, √9 is just 3.
|-5| is just 5.
and so on.
notice, in these cases, that you're merely *simplifying expressions*; you are NOT solving EQUATIONS. in other words, there's no "=" sign in the middle of what you're dealing with; you're not finding *the solutions of*anything. just simplifying.

when you solve an EQUATION, there may well be more than one solution.
if you say x^2 = 9, there are two solutions: x = 3 and x = -3.
notice that i can say this without speaking of the "√" symbol at all!

indeed, the "√" symbol is DEFINED to refer only to the positive root. it is NOT defined to refer to either of the 2 solutions to the above equation.

same goes for 4th root, 6th root, and all other even roots.

84.

B
"Susan drove an average speed of 30 mph for the first 30 **miles** of a trip. She did drove 60 mph for the next 30 **miles**"
?

in this case:
time for first leg of trip = 30 miles / (30 mi/hr) = 1 hr
time for second leg of trip = 30 miles / (60 mi/hr) = 0.5 hr
total time = 1.5 hr

average speed = 60 mi / 1.5 hr = 40 mi/hr

85.

OA: E

lesson to be learned here:
if you're dealing with simultaneous equations, don't sit around and philosophize; just set up the equation and see what happens.

the gmat test writers looooooooooove to write questions on which traditional algebra rules, such as 'n equations can solve for n variables', give incorrect answers. so *don't assume anything; just write the equation and do the work*. you'll find it's less work than you think.

I think it's Gross Profit = Revenue- Cost.

Notice that when you work the two conditions out, they essentially give you a value to one unknown variable, "k", but not "t." We would need to know what "t" is to be able to calculate the gross profit.

Essentially, what we are given in the question is:

Gross Profit = 1000(k+60)-1000k + t

With 1), we can get the revenue portion and find "k":
1000k+60,000=150,000
1000K = 90,000
K= 90

So what we have in the overall equation is: 1000(90+60) - 1000(90)+t. We don't have "t" so this is INSUFFICIENT.

With 2), we can get the cost side:
500k+t=1000K+t-45000

Notice the "t" cancels out. We are left with:

500K=1000K-45000
500K=45000
K=90

Again, we only get K=90. So with 2), we still only have:1000(90+60) - 1000(90)+t. INSUFFICIENT

Unless we have "t" we don't know what the gross profit is. So even with 1) and 2) together, we can't solve for "t." Therefore, E is the correct answer

Gross Profit = Revenue - Cost
Gross Profit = 1000*(k+60) – (k*1000 + t)

From 1, you can solve for k, but not t. Insufficient.
From 2, you have cannot solve for k and t since you have 2 equations, and three unknowns. Insufficient.

From (1) and (2), you can solve for k in (1), and then you can solve for t in (2). I marked C, but obviously that's not the correct answer.
Is the only reason that C is not the correct because statement 2 doesn't talk about the last month in particular, while the question asks for the gross profit for the last month? If statement 2 did indeed talk about last month, is there any other reason why C could not be correct? Thanks!

it looks like you're doing everything in your power to avoid writing the equation for statement (2). hint: that's a bad idea. in the time you spent rationalizing your decision *not* to set up the equation, you could easily set up the equation and just see what happens.

to wit:
statement (2) translates as
(500k + t) + 45,000 = (1000k + t)
500k + 45,000 = 1000k
oops
can't solve for t here, either
insufficient

86.

first, you must understand the holy canon of weighted averages. among the most important facts concerning such averages is the following:
in taking a weighted average of 2 quantities, knowing the RATIO of the quantities is equivalent to knowing the VALUE OF THE AVERAGE itself.

example: let's say everyone in a class scores either 80 or 90 on an exam; then that's a weighted average of 80's and 90's (the two quantities in question).
* if you know the average score for the class, then you can determine the ratio of 80's to 90's. (note that you *cannot* determine the actual *numbers* of those scores without additional information, such as the total # of students in the class.)
* if you know the ratio of 80's to 90's (or even more specific information, such as the actual numbers thereof), then you can calculate the class average for the exam.

--

REPHRASE THE QUESTION:
the overall cost per gallon is a weighted average of $3/gallon (for fuel x) and $5/gallon (for fuel y).
therefore, the question can be rephrased as follows:
what's the ratio of gallons of fuel x to gallons of fuel y in the tank?

STATEMENT 1:
this is equivalent to giving the miles per gallon for the fuel mixture: 200/8 = 25 miles per gallon.
fuel x gets 20 miles/gallon, and fuel y gets 40 miles/gallon.

* conceptually: you can just realize that, the larger the ratio of fuel y to fuel x, the better the miles per gallon will be. therefore, *each specific number of miles/gallon will correspond to a fixed ratio of fuel y to fuel x*; any higher ratio would give more miles per gallon, and any lower ratio would give fewer miles per gallon.
therefore, this information is sufficient.

* algebraically / using templates: you can think of this as a weighted average of 20 miles/gallon and 40 miles/gallon. same concept applies as above. therefore, sufficient.

STATEMENT 2:
this is equivalent to giving the miles per dollar for the fuel mixture: 7 1/7 miles per dollar.
fuel x gets 20/3 = 6 2/3 miles/dollar, and fuel y gets 40/5 = 8 miles/dollar.

* conceptually: you can just realize that, the larger the ratio of fuel y to fuel x, the better the miles per dollar will be. therefore, *each specific number of miles/dollar will correspond to a fixed ratio of fuel y to fuel x*; any higher ratio would give more miles per dollar, and any lower ratio would give fewer miles per dollar.
therefore, this information is sufficient.

* algebraically / using templates: you can think of this as a weighted average of 6 2/3 miles/dollar and 8 miles/dollar. same concept applies as above. therefore, sufficient.

ans (d)

87.

answer is C

simple interest calculates interest **based on the original value of the investment**, regardless of the amount of interest that the investment has accrued. therefore, the formula becomes just Prt, where P is the original amount of the investment, r is the interest rate (expressed as a decimal), and t is the time (usually in years).
the actual *value* of the investment after this time, not to be confused with the above formula (which represents only the total interest), is P + Prt = P(1 + rt).

even if you didn't realize that you were using the wrong formula, you could still get this problem right by using number plugging: with your n = 2 and x = 10, you get
(a) $10 million (wouldn't that be nice)
(b) $100
(c) $2000
(d) $12,100 (notice that this would be the value of the *entire investment* after using *compound* interest, but it's nowhere close to the interest alone)
(e) $22,000
the only one that's even remotely close to your compound-interest estimate is (c), so you should still get the problem correct.
although you get lucky this time; it's extremely common for at least one *incorrect* answer in a simple-interest problem to come from a compound-interest formula (or vice versa).

Let's say n=2 and x=10 percent
$10,000 would earn $1,000 in year 1 and $1,100 in year 2 for a total of $2,100.

Plugging these values into C gives us $2,000.

88.

the overall time must be a multiple of 30 seconds, because it takes 30 seconds to walk down each floor. (that's ridiculously slow - bad knees?) also, the 7 minute wait time is itself a multiple of 30 seconds.
this means that the actual time taken by the elevator must also be a multiple of 30 seconds, because we need to add it to another multiple of 30 seconds (7:00) and get still another multiple of 30 seconds.
the only answer choice that multiplies by 2 seconds to give a multiple of 30 seconds is (d).
done.

Here's the algebra equation:

7 min = 420 seconds.

420 + 2x = 30x

x = 15

89.
REPEAT PROBLEM

first, recognize that you want to make a proportion involving 2 quantities: (a) amount of concentrate and (b) amount of JUICE, NOT water.
to take care of (b), note that 1 can of concentrate is used to make 1 + 3 = 4 cans of juice (assuming that the volumes are additive, a necessary assumption here). therefore, **the ratio of concentrate to juice is 1:4.**

you want to make 200 x 6 = 1200 ounces of orange juice.

set up a proportion:
(ounces of concentrate) / 1200 = 1 / 4

solve:
300 ounces of concentrate

each can of concentrate contains 12 ounces, so 300/12 = 25 cans.

--

BACKUP METHOD
you could also solve this problem backwards: try plugging in the answer choices. if you try choice (c), you'll find that the answer is too big, so you can then eliminate choices (c), (d), and (e). at that point, just try one of the two remaining choices. if it works, it's the correct choice; if it doesn't, then the other choice is the correct choice.
or, if you have good number sense, you'll notice that (c) makes exactly twice the required amount of juice. therefore, the correct answer must be (a), which is half of (c).

90. D

.9Y + 10Y = 132,000

Why doesn't that work?

this won't work because, if *X* is 10% greater than *Y*, then *Y* is **not** 10% less than *X*.

this is a universal truth for *all* nonzero percentages, of which you should be acutely aware on test day: **an increase of p% and a decrease of p% DO NOT cancel other out.**
this is in fact a corollary of a much more general principle stating that *percent changes are never additive*. for instance, if a quantity is increased by 20% and then the resulting quantity is increased by 30%, then the original quantity *did not* increase by 50%.
this is a common trap on percent problems. if you know it, then you'll be able to eliminate the "sucker answer" right away on many such problems.

you can also figure this out for yourself by thinking about things that are intuitively easier than 10% changes. for instance, to undo cutting something in half (50% decrease), you'd have to double it (100% increase).

--

in your solution, you're assuming that the least populated district should be 10% *less* populated than the most populated district. as noted above, this is *not* the same as assuming that the most populated district should be 10% *more* populated than the least populated district.

91.

time taken by Car B = x hrs
time taken by car A = x-2 hrs

speed of car A = 400/(x-2)
speed of car B = 400/x

given speedA- speedB = 10mph

so 400/(x-2) - 400/x = 10

400x- 400x + 800 = 10x(x-2)

800 = 10x^2 - 20x

x^2 - 2x - 80 = 0
(x+8)(x-10) = 0
clearly x = 10

so the answer is 400/10 = 40 (C)

OR

car A speed = x + 10
car B speed = x

now, rt = d. therefore, t = d/r.
therefore,
car A time = 400 / (x + 10)
car B time = 400 / x

per the problem statement, car B took two hours longer to travel the distance than did car A.
therefore,
400/(x + 10) + 2 = 400 / x

at this point, you *could* solve this equation with quadratic techniques and factoring, as in the previous example.
but this approach is slightly superior to that one, in that **you can solve at this point by just plugging the answer choices into the equation**.
you can do so in this case because the answer choices represent the average speed of car B, the quantity for which variables were chosen in the first place.
this is faster - not to mention *much* easier - than quadratic techniques (unless you're lightning fast at quadratics).
plugging in choice (c), the correct answer, yields

400/50 + 2 = 400/40
8 + 2 = 10
since this is a true statement, (c) is the correct answer.

--

moral of the story:
on problems such as this one - on which there is absolutely no difference, algebra-wise, between the different options for a variable (here, you're going to wind up with fractions --> quadratic either way), **you should try to pick a variable for which you can plug in the answer choices if you get stuck**.
for this problem, the answer choices represent speeds. therefore, if you're algebraically indifferent between speeds and times, you should use your variable to represent speed, so that you can plug in if you come to an impasse and/or don't feel like solving a quadratic with fractions.

92.
THE QUESTION IS THE SAME AS 91... ignore

93.
well, ok, all you have to do is plug into the formula. but the key here is the word "estimated": you don't want to work with EXACT numbers such as 5280. too much pain there, unless you're ridiculously fast at arithmetic (like "rain man" fast).

the formula says: N = (20 x 2 x 21 x 5280) / (600 + 1600) -- note that 'd' is 21 x 5280, not just 21, because it has to be converted into feet.
estimate as (20 x 2 x 20 x 5000) / (2000) -- note that we're rounding down BOTH the numerator and the denominator, so that the roundings will offset each other a bit. you don't want to, say, round *down* the denominator and round *up* the numerator, because those changes would amplify each other. if we round things, we want to make changes that will offset each other ('cancel each other out').
you can take out the '000's from both sides, leaving 20x2x20x5 / 2, or 20x20x5, or 2000.
my calculator says the exact value is 2016, so this is pretty good.

but, um ... the answer choices?

are you sure the problem statement didn't say PER MILE of the stretch of highway? that would make a lot more sense, as that would be approx. 2000/21 ~ 2000/20 ~ 100 cars per mile, so, (b).
in fact, i'm pretty sure the problem did say PER MILE, because my calculator says that the exact value of 2016/21 is EXACTLY 96 cars per mile.

not to mention that this makes a lot more sense - all of the answer choices are preposterously low for the number of cars traveling on twenty-one miles of double-lane highway, but they're perfectly reasonable *per mile* of highway.

you're converting d into feet because the problem statement requires that d be expressed in feet. go back and look at it again.

the way to understand formulas like this is as follows: the constants in these formulas contain hidden units that *do* cancel out the remaining units. they just aren't expressed in the formula, because they would add needless bulk without aiding in the computations in any way.
for instance, the "600" must be in mi^2/hr^2, because it must have the same units as does s^2 (otherwise the addition in the denominator would be impossible). but it's not as though we're going to go around writing that as "600 mi^2/hr^2". no way jose.

same goes for the "20", which can be understood to have whatever units are necessary to produce the required cancellation of units.

94.

* start with the *starting information*, usually a concrete value. here, that concrete value is 22 yards. note that **rates are not "starting information"**; those count as conversion factors.

* to accomplish the conversion, create CONVERSION FACTORS, which have EQUAL quantities on the top and bottom of the factor. there are two types of such conversion factors:
- RATES (which are naturally fractions already)
- REFERENCE CONVERSIONS (such as 12 inches = 1 foot) which are universally true and could be looked up in a reference book if necessary.

* position the fractions so that UNWANTED UNITS CANCEL and the desired units are left in the desired places.
- note how the 45 mph is positioned so that it's 1 hour per 45 miles, not 45 miles per 1 hour. this is done so that the miles are cancelled out.

--

in the problem shown, 22/1760 cancels down to 1/80, and 3600/45 cancels down to 80/1. therefore, 80/80 = 1, so the whole fraction gives **1 second**. are you sure you didn't copy some number with an incorrect decimal place or other similar error?

plus, think about this intuitively: if a car is traveling at 45 miles per hour, which is approaching highway speeds, then it's ridiculous to think that it would take 8 to 12 seconds to travel 22 yards. the average human can *run* 22 yards in about three seconds. check the problem!

95.

Imagine a right triangle PQR where the angle Q is 90' (from the given fact that Q is due east of P and north of R).

Distance between Q and R is y as given in the question and speed is Z, also given in the question. Therefore time from Q to R is y/Z.

Distance between R and P can be derived from Pythagorean Theorem because the angle Q = 90'.
By using the Theorem, distance between R and P is sqrt(x^2 + y^2). Speed from R to P is Z which is given in the question.
Therefore time from R to P is (sqrt(x^2 + y^2))/Z.

By simply adding the two, y/Z + (sqrt(x^2 + y^2))/Z = (y + sqrt(x^2 + y^2))/Z.

96.

you can use the formula:

a^2 - b^2 = (a-b)(a+b)

Thus with the given question :

(1001^2 - 999^2)/(101^2 - 99^2) can be written as:

(1001+999)(1001-999)/(101+99)(101-99)

= (2000 * 2)/(200 * 2)

= 10

97.

step 1 * recognize that everyone's hours are connected to everyone else's hours, and that therefore **only one variable is necessary** in this problem

step 2 * **use the variable for kate**, because kate works the **smallest** number of hours (thereby avoiding fractions)

step 3 *
kate = x
pat = 2(kate) = 2x
mark = 3(pat) = 6x

step 4 *
kate + pat + mark = 162
x + 2x + 6x = 162

6x+2x+x = 9x = 162. solve for x. Mark has 108 and Kate has 18 so the difference is 90.

98.

if there are 60 rooms total, then the motel rented 45 rooms. this means that **15 of the rooms were not rented.**
also, 3/5 of 60, or 36, rooms have aircon; the motel rented 2/3 of these, or 24, rooms. this means that **12 rooms with aircon weren't rented.**
12 out of 15 = 80%.

99.

ans: e

one way you could do it: number picking. just try different numbers of P's and I's/F's, and see whether the answer is invariant or whether it changes. if it changes at all, then the data are insufficient.

* let's try 100 p's and 100 f/i's
among the 100 p's, there are 60 males and 40 females.
among the 100 f/i's, there are 80 males and 20 females.
so 60 out of 200, or 30%, are female.

* let's try 1000 p's and 100 f/i's
among the 1000 p's, there are 600 males and 400 females.

among the 100 f/i's, there are 80 males and 20 females.
so 420 out of 1100 are female. this is a weird percentage, but it's clearly not 30% (which would be 330 out of 1100), so, insufficient.

--

you could also do it by realizing that this is a **WEIGHTED AVERAGE** of 40% (the percentage of p's that are female) and 20% (the percentage of f/i's that are female). like any other weighted average, this one depends on the relative quantities of its components (here, p's versus f/i's), quantities that are not given in either of the two statements.
conceptually, if there are huge numbers of p's and negligible numbers of f/i's, then the percentage of females will be very close to 40%. conversely, if there are huge numbers of f/i's and very few p's, then the percentage will be very close to 20%.

in fact, there's nothing prohibiting the consideration of the two most extreme cases possible:
* ALL grades are p's --> 40% female
* ALL grades are f/i's --> 20% female
these situations are both allowed under the given conditions, so, insufficient.

so E

100.
Official Answer is C.

just remember that you don't actually *have* to solve systems like this one, and, indeed, it's a complete waste of time to solve them. all you have to do is *realize* that you *can* solve them.

statement 1: Pb = Pa + 200
insufficient by itself

statement 2: 0.05Pa + 0.08Pb = 120
insufficient by itself

both statements together: sufficient
(both statements are linear equations, and neither one is a multiple of the other; therefore, the 2x2 system has a unique solution)
there's no need to actually solve the system; all you have to do is note that you *can* solve it.

101.

ans: E

I think it's Gross Profit = Revenue- Cost.

Notice that when you work the two conditions out, they essentially give you a value to one unknown variable, "k", but not "t." We would need to know what "t" is to be able to calculate the gross profit.

Essentially, what we are given in the question is:

Gross Profit = 1000(k+60)-1000k + t

With 1), we can get the revenue portion and find "k":

1000k+60,000=150,000
1000K = 90,000
K= 90

So what we have in the overall equation is: 1000(90+60) - 1000(90)+t. We don't have "t" so this is INSUFFICIENT.

With 2), we can get the cost side:
500k+t=1000K+t-45000

Notice the "t" cancels out. We are left with:

500K=1000K-45000
500K=45000
K=90

Again, we only get K=90. So with 2), we still only have:1000(90+60) - 1000(90)+t. INSUFFICIENT

Unless we have "t" we don't know what the gross profit is. So even with 1) and 2) together, we can't solve for "t." Therefore, E is the correct answer

102.

Ans - 75

First use the given info to get the constant A. It comes out to be 1/10
Next substitute it in teh equation with t = 30.

F = 120 (2^(-at)) + 60

First data point is (10,120); use that to find a.

120 = 120(2^(-10a)) + 60
60 = 120(2^(-10a))
1/2 = 2^(-10a)
1/2 = 1/(2^(10a))
(1/2)^1 = (1/2)^(10a)
drop the bases and set the exponents equal to each other
1 = 10a
1/10 = a

Then plug that in to find F when t=30:
F = 120(2^(-30*1/10)) + 60
F = 120(2^-3) + 60
F = 120(1/8) + 60
F = 15 + 60
F = 75

103.

answer A ?

This is how I approached it :
since equal amounts of money needs to be spent on the 2 type of computer ($ 600, $ 375)
let x be the number of computer printers for type --A --> $ 600
Let y be the number of computer printers for type --b --> $ 375

600x = 375y

x/y = 375/600
x/y = 5/8

Thus minimally for 5 Type X, for the costs to be equal there has to be 8 type Y
you can also check:
5 * 600 = 3000
8 * 375 = 3000

Thus, total number of computers: 5 + 8 = 13

you can also realize that this problem is a thinly veiled way of asking you for the *least common multiple* of the two prices. in fact, that shouldn't be that hard to see here: you're looking to spend *equal amounts* of money on the two types of items, so, those equal amounts must be *multiples of both prices*. since you're looking for the smallest such multiple, you're looking for the smallest number that's a multiple of both prices - which is the exact definition of the least common multiple.

to find the least common multiple, you could just experiment with numbers, but, if you're looking for a more systematic way, you could use prime factorizations:
600 = 6 x 100 = (2 x 3)(2^2 x 5^2) = 2^3 x 3 x 5^2
375 = 3 x 125 = 3 x 5^3
the least common multiple takes the *highest* power of *every* prime number appearing anywhere in these factorizations. therefore, the least common multiple is 2^3 x 3 x 5^3, or 3000.

104.

Answer: 1/5

you can also do this problem by *picking numbers*, because you don't have a figure for the monthly pay (and, apparently, it doesn't matter, because the problem would be impossible to solve if it *did* matter).

so just let the monthly pay be '1'.
let the monthly savings be 'S', which is both a fraction and an actual amount of money. (it's both because the monthly pay is '1', so the fraction is the same as the dollar amount)
then she has saved 12S at the end of the year.
each month, she *didn't* save (1 - S)
so
12S = 3(1 - S)
12S = 3 - 3S
15S = 3
S = 3/15 = 1/5

faster, and probably less confusing, with only one variable

take home pay to be y per month
Fraction she saves: x

thus:

12x = 3*12 (y - x)
12x = 36y -36x
48x = 36y
x/y = 36/48 = 3/4

Not sure what I am doing wrong here !!

The wording on this does suck...

S = 3 (T-S)/12 since it is said that the total saving is equal to 3 times that is not saved each month.

S = (T-S)/4

5S = T, hence S/T = 1/5

THE ANSWER IS 1/5.

Alice's total take home per month = x
Alice's saving per month = y
Alice's saving for the entire yar = 12y
What Alice did not save = x-y
As per the stem , Alice's annual saving = 3 time what she did not save pre month
i.e. 12y = 3(x-y)
4y = x- y
y = x/5.

105.

Answer: C

to attack statement (1), it helps to have a protocol for COMBINING RATIOS. fortunately, this is pretty easy to do.

here's what you do:
* find the term or thing that's common to the 2 ratios ("children", in this case)
* MULTIPLY the ratios by appropriate factors (in exactly the same way you'd multiply the numerator and denominator of a fraction - because ratios, after all, are just glorified fractions) to generate that least common multiple in both
* combine the ratios

for statement (1) here, then:
the prompt tells us that C : W = 2 : 5, and statement (1) tells us that C : M = 5 : 11.
the two C terms are 2 and 5, so the least common multiple is 10.
multiply by 5's to give C : W = 10 : 25, and multiply by 2's to give C : M = 10 : 22.
therefore, C : W : M = 10 : 25 : 22.
from this ratio, it's easy to see that the # of children must be a multiple of 10, the # of women must be a

multiple of 25, and the # of men must be a multiple of 22.
combined with statement (2), this means that the numbers must actually be 10, 25, and 22, since any multiple thereof would be way too big to satisfy the "under 30" criterion.

106.

1x+2y+3z = 1.5(x+y+z)
x+2y+3z = 1.5x+1.5y+1.5z
1.5x-x = 2y-1.5y+3z-1.5z
0.5x=0.5y+1.5z (divide by 0.5 on all sides)
x=y+3z

So answer is 'A'

the easiest way to do this is to *pick numbers*. in fact, you can pick numbers on ALL problems whose question prompts feature the words "in terms of", because such problems, by definition, work with *any* given values of those variables.

let's pick easy numbers: y = 2, z = 4. (these aren't totally random. the choice for y is essentially random, but z has been deliberately chosen so that #2 and #5 will be integers.)

then we have:
x gallons of 1% = 0.01x gallons of fat
2 gallons of 2% = 0.02(2) = 0.04 gallons of fat
4 gallons of 3% = 0.03(4) = 0.12 gallons of fat
total fat = 0.01x + 0.04 + 0.12 = (0.01x + 0.16) gallons
total volume = x + 2 + 4 = (x + 6) gallons

so:
(0.01x + 0.16)/(x + 6) = 0.015
multiply by 100 ----- (x + 16)/(x + 6) = 1.5
multiply through by (x + 6) ----- x + 16 = 1.5x + 9
7 = 0.5x
14 = x

check the answer choices with y = 2, z = 4:
a: 14
b: 3
c: 16
d: 10
e: 24

a wins

107.
Answer is C.

this is *simple interest*.

simple interest is calculated by just multiplying the interest rate (as a decimal) by the *original* principal. it particular, it is not *compound* interest; i.e., the interest only accumulates on the money that was originally in the account at time zero. the interest money

itself doesn't accumulate any interest (unlike in compound-interest investments, where interest accumulates on everything, including the newly accrued interest money).

because of this definition, the amount of simple interest is *exactly* the same *every year* for each investment. therefore, if the 2 investments accrue the same amount of simple interest in the first year, then they must accrue the same amount of simple interest in every year.

P=24k; P= X+Y
Interest= PNR/100;
Interest(X)= (24000-Y)*1*R/100; Interest(Y)= (24000-X)*1*R/100

What is X?

Using BDACE Grid:
2) R(X)= 5%
But we dont know how much is the investment Robin put into X. Hence INSUFF

1) Each investment earns the same $ amount of the interest annually.
Interest(X)= Interest (Y) but we dont know about the Rate of Interest for either X or Y. Hence INSUFF

Using 1 and 2,

we know the Interest Rate for X; Also the $ of Interest Earned Annually from X and Y are equal. There by we can find how much invested in Y.

first, find expressions for the interest on each of the two accounts:
interest on x = 0.07x
interest on y = (rate)(24000 - x)

(1) alone:
0.07x = (rate)(24000 - x)
this is one linear equation, with two unknowns, so it can't be solved uniquely.
insufficient

(2) alone:
interest on x = 0.07x
interest on y = 0.05(24000 - x)
but there's no equation relating these two things
insufficient

together:
0.07x = 0.05(24000 - x)
linear equation in one variable --> can be solved uniquely
sufficient

answer = c

108.

B

let FJ stand for the number of students who study both french and japanese. let F stand for the number who study french (regardless of whether they study japanese), and let J stand for the number who study japanese (regardless of whether they study french).

--

the prompt states that FJ is 4% of F (*not* that J is 4% of F; make sure that you know this). this can be restated in a couple of ways: FJ = 0.04(F), or F = 25(FJ).

--

statement (1):
this says that FJ = 16.
therefore, F = 25(FJ) = 400.
we don't know anything about J other than that J > 100 (as stated in the prompt), and that's insufficient to determine whether F = 400 is greater than J.
insufficient

--

statement (2):
this states that FJ is 10% of J (again, *not* that F is 10% of J).
equivalently, FJ = 0.1(J), or J = 10(FJ).
since J = 10(FJ) and F = 25(FJ), it follows that F > J.
sufficient

--

answer = b

109.

So the question entails finding the number of hours it takes X to fill the entire lot.

X works for 4 hours and Y worked for 3 hours to fill the lot.

1) X produced 30 bottles per minute, thus 4 * 60 * 30 = 7200 bottles for 4 hours. However we do not know Y's rate to determine the number of bottles Y finished, and subsequently the time required by X to produce the total ## of bottles. Thus, insufficient

2. X produces twice as many bottles in 4 hours as machine Y in 3 hours
Assume Y produces b bottles, machine X produces 2b bottles
Total bottles produced: b + 2b = 3b in 7 hours

We know:
Machine X produces: 2b bottles -----> 4 hours
3b bottles can be produced in ----- > (4/2b) * 3b = 6 hours. Thus 2 is sufficient.

Answer B.

110.

OA is D.

i'll lay out the key step more explicitly than is done in the other posts.

here's the deal:
if you want to *maximize* the number of books taken by one person, then you need to *minimize* the number of books taken by the other people.

incidentally, this is a really common theme in 'optimization' problems:
to maximize one quantity, minimize the others; to minimize one quantity, maximize the others.
this is supremely obvious in some circumstances - for instance, if a baseball team with a salary cap wants to pay superstar X as much as possible, it can only do so by paying all the other players as *little* as possible.

--

another common theme:
if you're given a statement about an *average*, then you should transform it into a statement about a *sum*.

--

if we follow both of the above points of advice, we arrive at the following solution:
first, realize that the 'average of 2 books' statement is really just a roundabout way of telling you that the 30 students took out a total of 60 books.
the mentioned quantities add up to 32 books, so you have to account for the other 28 books, among 6 students.
if you *minimize* the book count for five of the six students, that's 3 books per student = 15 books.
28 - 15 = 13 books for the lucky sixth student.

111.

the answer is B.

the total number of p+s=75, and p itself has 48 (the total number of p), so it give us (75-48)=27 (the total number not P)
in statement 1, p=38, but don't have s (48-38)=10. however, it does not tell us anything about not p or not s. it is not sufficient to answer the question.

statement 2: the number of (total number of p)+(total number of s)=total number of not p+ total number of not s, since we know the total num. of p=48, and total num. of not p=27, now you can figure out the answer. so it is sufficient to answer the question.

Ans. B

112.

S = P + 0.4S

0.6S = 150
S = 150/0.6 = 250
Profit = 40% of 250 = 100

Cost Price of Desk = $150

Mark - up = 40% of S.P.

i.e. cost price = 60% of S.P.

Let x be the Selling price of the desk, then

60% of S.P. = 150

x=$250

Therefore, profit = $250 - $150 = $100

Ans. (e)

113.

OA is D. Someone please explain. Thank you!

(1)

remember that ratios are the same as fractions in this sort of context.
this statement means that the FT employees are a *smaller* fraction of division Y than of the company as a whole. this means that they must be a *bigger* fraction of division X than of the company as a whole, because the fraction of the whole company that's employed FT must be *between* the two divisions' fractions.
sufficient.

(analogy: if i mix two powders together to make a shake that's 5% fat, and the first powder is 3% fat, then the second powder *must* be more than 5% fat)

--

(2)
the first part means that (FT in div. X) > (FT in div. Y), and the second part means that (PT in div. X) < (PT in div. Y).
therefore, considering the ratio of FT : PT for each division, we have that FT/PT for div. X must be greater than FT/PT for div. Y. (this is the case because of *either* the numerator or the denominator: the numerator of X is greater, *and* the denominator is smaller.)
since the FT/PT fraction is bigger for div. X than for div. Y, it must be bigger for div. X than for the company as a whole (see the reasoning above under statement (1) for why this is true).
sufficient.

Statement (1) says - (F.T in Y)/(P.T in Y) < (F.T in Z)/(P.T in Z). We do not know the distribution of employees within the X & Y, also there is no information about the distribution of Full time and part time employees in Z. Hence insufficient

Statement (2) gives information about the employee distribution between X & Y, in terms of full time and part time employees. To realize the information lets assume: -

Total employees in Z = 50, Total Full Time = 30, Total Part Time = 20 Ratio in Z = 30/20 = 3/2

So, No. of Full time employees in X > 15(more thn half) lets assume 18,

Also No. of part time employees in Y > 10(more thn half). lets assume 12

So the no. of part time employees in X =8 Hence ratio in X = 18/8 = 9/4 >2

Similarly ratio in Y = 12/12 = 1

So Ratio in X > Ratio in Z > Ratio in Y

But we don't know the distribution of Full time Vs Part time employees in Z, X& Y
So lets flip to the no of F.T in Z = 20 and P.T = 30 Now Ratio in Z = 20/30 = 2/3

So No. F.T in X > 10 (Assume 12) so F.T in Y = 8

and P.T in Y > 15 (Assume 18) so P.T in X = 12

Ratio in X = 12/12 = 1
Ratio in Y = 8/18 = 4/9
Ratio in X = 2/3

Ratio in X > Ratio in Z> Ratio in Y

Hence it is sufficient. Answer is (B)

You are right on about statement (2). As for (1), watch out for ratio problems like this...the important take-away is that ratios are often more powerful than they look. You may have more information than you think because, by definition, ratios have a relationship between variables embedded in them. Here's the approach I used for (1).

Set up a chart with X, Y, and Z (the total of X + Y) in columns, and PT and FT in rows. We'll call the number of PT employees Px, Py, and Pz for X, Y, and Z, respectively. Remember that Px, Py and Pz are all greater than 0. Similarly, we'll call the number of FT employees Fx, Fy, and Fz for X, Y, and Z, respectively.

The question asks: Is Fx/Px > Fz/Pz?

(1) SUFFICIENT: We are told that Fy/Py < Fz/Pz.

Note that (Fx + Fy = Fz) and (Px + Py = Pz) so we can write the division Y quantities in terms of the Z and X quantities, rephrasing the statement this way:

Fy/Py < Fz/Pz
(Fz - Fx)/(Pz - Px) < Fz/Pz
Pz(Fz - Fx) < Fz(Pz - Px) <--We don't have to flip the sign here; the question told us that all P values are positive.
PzFz - PzFx < FzPz - FzPx
- PzFx < - FzPx
PzFx > FzPx <--Flip the sign here; we multiplied by -1.
Fx/Px > Fz/Pz <--We don't have to flip the sign here; the question told us that all P values are positive.

This answers the question with a definite "yes."

So, the correct answer is D.

114.

I set up the grid like you said with the top being D1 & D2:

1 2 Total
R R R+1

T T T+2 18

D d (64-d) 64

as you said, t=8.

Thus, let's simply Day 2 first:

(R+1)10=64-d
10R+10=64-d
d=54-10R

Set the two distances equal to each other:
RT=54-10R

Plug in t=8
8R=54-10R
18R=54
R=3

115.

D

notice that, because this is data sufficiency, there's actually no need to solve the equation in the second part.

just set it up:

Sum = Average x Number. so if "x" is the number of sockets installed, then Sum (total cost) = 30x.
but we also know that Sum = 30 + 20x.
therefore, 30x = 30 + 20x
sufficient
no reason to actually solve.

Option a) is sufficient as you are told directly how many sockets he installed

Optiob B) is sufficient because using average formula = s/n you can calculate how many plugs he installed
first you make x the unknown number of plugs.. the you calculate the sum as 20x +30/ x=30

cross multiply this will give you 20x +30 =30x-20
30= 30x-10x
30/10=x
3=x
therfore both stems are sufficient..

116.

The ans for this is A

this is good. remember that you don't have to actually solve a system, if you know that it *can* be solved for a unique solution.

note that this is a WEIGHTED AVERAGES problem.
on weighted averages problems, if you know any 2 of the following 3, then you can find the third one:
1. the ratio of 'weights' of the different quantities
2. the values of the quantities
3. the weighted average

in this problem, we have the values of the quantities (36 and 50), as well as the weighted average (42). that's enough information to find the ratio of the 'weights' (which happens to be 4:3 m:f, although you don't particularly care because it's data sufficiency).
because you have a total for everybody (1400), that ratio is enough to give you a hard number for the # of women.
sufficient.

--

if you know the relationships posited above, you can get through weighted averages on data sufficiency *very*quickly - although it's still helpful to know the algebraic method so you can break it out on problem solving.

stem: 42/100 x 1400 said that they considered engaging..., so 588 are considered engaging, 812 are not considered engaging...

2) of the 588, 288 are men, so 300 are women are engaging -- but how many women are NOT considered engaging...?
INSUFFICIENT

harder of the 2 statements:

1) 36% of Men and 50% of Women are considered engaging...so 36/100 M + 50/100 W = 588 and M + W = 1400

2 distinct linear equations, 2 variables
SUFFICIENT

answer is A

117.

Answer is C, both statements together are sufficient.

the statement "2/3 are **either cows or pigs**" doesn't mean that there are either 40 cows or 40 pigs. it means that, if you take the cows and the pigs together, they constitute 2/3 of the animals on the farm. in other words, **cows + pigs = 40.**
(i can understand your alternate reading of the problem statement; it's reasonable enough. just remember that the gmat is their playground, not yours, and so you have to play by their rules - so remember the way certain statements are written. as a postscript, i hope that future problems like this one will be purged and/or rewritten for clarity before they make it into the official question pool; it would be a shame if students miss the problem just because of its ambiguity.)

thus:

(1)
this means that there are at least 27 cows (because 27 cows, 13 pigs is the least # of cows satisfying this criterion).
that's all we know, though; there could be anywhere between 27 cows (and therefore 13 pigs) and 40 cows (and therefore 0 pigs).
insufficient

(2)
this means that there are at least 13 pigs, which means that there are *at most* 27 cows.
that's all we know.
insufficient

(together)
(1) says there are at least 27 cows; (2) says there are at most 27 cows.
so, there are 27 cows and 13 pigs.
sufficient

answer = c

under statement (1), i wrote that you can have *any* possibility of (cows, pigs) between (27, 13) and (40, 0).
this means you could have (27, 13), (28, 12), (29, 11), ..., (40, 0).
that's why the statement is insufficient.
Rephrase the question:
60 * 2/3 = 40 pigs or cows
p + c = 40

1)
Example 1: pigs = 2 cows = 38
Example 2: pigs = 4 cows = 36
Insufficient

2)
Example 1: pigs = 13 cows = 27
Example 2: pigs = 39 cows = 1
Insufficient

Together)
pigs = 13 cows = more than twice 13, or 26

13 + c = 40
c = 27
Valid, since 27 is greater than 26

pigs = 14 cows = more than twice 14, or 28
14 + c = 40
c = 26
Invalid, since 26 is not more than 28

Any larger number of pigs will also be invalid.

Sufficient. There are 13 pigs and 27 cows.

118.

I would say the answer c

y-x=100, we can rewrite y=100+x, then Sub. into statement 1: (100+x)*(100-x)=5040, then to find out what's x. since x can not be negative, so use the positive x to find out what is y.

119.

The correct answer is C. 6.

Machine R can do 1 job / 36hrs. S does 1 job / 18 hrs. We want the total to be 1 job / 2hrs

So this is the equation where x represents the number of machines you need:

rate of R + rate of S = rate of total
x/36 + x/18 = 1/2
(multiply all by 36)
x + 2x = 18
3x = 18
x = 6 machines

120.

The answer is B.

From fact (1) the store sells 8 books on Thursday. All fact (1) tells you is that the store sold more than 8 books on both Friday and Saturday. For example, it might sell 1 book on sunday, two on Monday, 3 on Tuesday, 4 on Wed, 9 on Friday and 63 on Saturday. Or it could sell 1 on Sunday, 2 on Monday, 3 on Tuesday, 4 on Wed, 8 on Thursday, 30 on Friday and 42 on Saturday. It is clearly insufficient by itself to answer whether the store sold more than 11 copies on Friday. We can rule out answer choice A&D.

Let's consider (2), the fact that the store sold 38 copies on Saturday. This means that it must sell 52 books on the first six days of the week. Is there anyway to do this subject to the constraints in the problem statement? There are two approaches to this that will work, plugging in number and algebraic:

a) Plug in numbers. It's pretty easy to see that there are values greater than 11 books sold on Friday that will work. For example, 30 books on Friday, 8 books on Thursday, 6 books on Wed, 3 books on Tuesday, 4 books on Monday and 1 on Sunday. What about when the books sold

on Friday are 11 or less? Well, start with 11 books on Friday. Then because of the constraints in the problem statement, the most books sold on Thursday would be 10. Similarly the most books sold on Wed would be 9, Tuesday 8, Monday 7, and Sunday 6. Summing all these up only gets you to 51 books sold Monday - Friday, so there is no way of getting to 90 books sold for the week when you sell 38 on Saturday and only 11 or fewer on Friday. So (2) is sufficient by itself and the answer is b.

b) You can also approach this algebraically. If F is the number of books sold on Friday, then the smallest acceptable value of F is given by the equation F+(F-1)+(F-2)+(F-3)+(F-4)+(F-5) = 52. This gives a value of F = 11 1/6. So it's not possible to satisfy the constraints with a value of F equal to 11 or less.

(2) Last week Store S sold 38 copies of the book on Saturday.
as -

If 38 are sold on the highest day the the rest 6 days sold 52 copies.
ie. each day on average sold 8.66 copies.
Since we know Friday is 2nd highest and all days are unique. I might have something like this 6, 7, 8, (8.66), 9, 10, 11+. Note that since ave is 8.66 so 11 will not do it has to be 11+. (I am using the property median = average for consecutive nos,)
Note that this is the best case. There is no other way to reduce 11+ (try it, remember all nos are unique).

to *minimize* the number of copies sold on friday, you should try to make the sales for all days except saturday (which is fixed) as even as possible. (you can't make friday 0 copies, because friday has to be the second greatest sales day.)
you have 90 - 38 = 52 copies to distribute between six days.
the closest you can get together is consecutive integers; if you try to sell only 11 copies on friday, the best you can do on the other days is 10, 9, 8, 7, 6. that's a total of 51 copies on those days - not good enough. you must sell one extra copy; but because your numbers are currently consecutive integers, you are forced to increase friday. therefore, you must sell at least 12 copies on friday.

to *maximize* the number of copies sold on friday, you'd make the other days' sales 0, 1, 2, 3, and 4 copies - but note that you don't have to do this, because we've already established that the *minimum* possibility is greater than 11 copies (so we don't particularly care what the maximum is).

this sort of reasoning shouldn't take four minutes, *provided you're used to it*. just realize that if you want to make the *greatest* number in a group of *different* numbers as small as possible (or make the smallest one as big as possible), then consecutive integers are the way to go.

Statement (2): The store sold 38 copies on Saturday. So in the rest of the 6 days combined, it sold 52 copies. We need to find out whether we can express 52 as the sum of 6 distinct numbers (no two days had the same sales as per the question) with one of them greater than 11.

In order for us to express 52 as a sum of 6 distinct integers, one of the numbers has to be greater than 11. Because if you start with 11, the largest 6 distinct number combination we can have is:

11 + 10 + 9 + 8 + 7 + 6 = 51.

But 12 + 10 + 9 + 8 + 7 + 6 = 52

Since the question says Friday has the 2nd greatest sales, the largest number in the 6 number combo will be the Friday sales which is greater than 11.

SUFFICIENT.

Statement (1): It says Thursday had a sales of 8 copies. By applying the same logic, in Statement (2), we may be able to find 6 distinct numbers that makes 82, but it is not sufficient to tell whether Friday sales will be greater than 11.

NOT SUFFICIENT.

Remember in a yes / no DS question, you want to see if you can make a statement give you both a yes and a no, in which case it is insufficient. As guest points out, for statement 2, we can only find a value for Friday that is 12 or greater. For statement 1, let me elaborate just a little:

Th = 8, so remaining days combined = 82.

I could have 25 + 20 + 15 + 10 + 8 + 4 = 82, in which case Friday = 20. That gives me a "yes."
I could also have 50 + 10 + 8 + 6 + 5 + 3 = 82, in which case Friday = 10. That gives me a "no."

A yes and a no = insufficient.

(1) tells you nothing much, since it just gives you the number for Thursday. We know that Friday and Saturday are greater than Thursday, but not how much greater. So, I would definitely start with (2), as it gives you the quantity sold on Saturday, which you know is the maximum.

Evaluate (2) with this question in mind: "Could 11 or fewer books have been sold on Friday?" If not, you know Friday's sales had to be greater than 11:

Try Friday = 11, and fill in the rest of the days with the best case scenario (the maximum books sold). I thought to maximize the other days because 38 is far short of the 90 total--the store must have sold a lot of books between Sunday and Thursday:

6 7 8 9 10 11 38

The sum: 6+7+8+9+10+11+38 = 89.

So, if only 11 books were sold on Friday, there is no way that the store sold 90 books. The number of books sold Friday must be greater than 11. The answer is definitely Yes.

121.

Answer is B

remember that gross profit = selling price - cost. since we don't know either of these, let's give them both variable names: s = selling price, c = cost.

we can rephrase the question as:
what is 20s - 20c?

we can divide this out by 20 to give, **what is s - c?**

NOTE: if you have ANY hesitation or uncertainty in generating equations like the ones i'm about to write below, then you should use an ORGANIZATIONAL CHART to solve this problem. in that chart, you should track the meaning of the different variables, as well as the relationships among them.
there are several different ways to make the chart, but it should focus on the idea that gross profit = selling price - cost, as mentioned above, as well as on the idea that total selling price = # of units x unit price.

(1)
this means that you change the selling price from s to 2s, while leaving c invariant.
20(2s) - 20c = 2400
divide by 20: 2s - c = 120
this doesn't allow us to find a value for s - c
insufficient

(2)
this means that you change the selling price from s to s + 2, while again leaving c invariant.
20(s + 2) - 20c = 440
20s + 40 - 20c = 440
20s - 20c = 400
s - c = 20
sufficient

answer = b

121.

Lets C.P of each coat be x and S.P be y, so profit is 20(y-x), so we have to find the values of 20(y-x)

(1) S.P = 2y, profit = 20(2y -x) = 2400
=> Using this we cannot get the value of 20(y-x) . Hence Insufficient

(2) S.P = y+2 , profit => 20(y+2 - x) = 440
=> 20y + 40 -20x = 440
=> 20(y-x)=400 .

We are only interested in this expression 20(y-x) which is the profit , not the individual values of x and y. Hence this is sufficient.

122.

The answer is B.

2/3 ~ 0.67,

Options A, C & E are all less than 0.67 while both B & D are greater than 0.67...

B) 8/11~ 0.73

D) 13/17~ 0.76

123.

1st day = 0.1
2nd day = 0.1*2 = 0.2
3rd day = 0.2*2 = 0.4
4th day = 0.4 + 0.3 = 0.7

124.
ANSWER IS C

'k' to be karen's 1995 salary, and 'j' to be jason's 1995 salary.

each of the statements alone is insufficient, because the first statement provides no information about the 'after' condition and the second statement provides no information about the 'before' condition. you need the 'before' AND the 'after' to figure out anything involving percentage changes.

you can write the '98 salaries as (1 + p%)k and (1 + p%)j, as the original poster has done, or you can write them as (1 + p/100)k and (1 + p/100)j. it's immaterial; either approach is fine.

then write the equation, in pretty much exactly the same way as in the above post.

the important realization at this step is that there's no reason to solve the resulting equation all the way; it's sufficient to stop at the point where the j's cancel, whereupon 'p' is the only variable left in play. at that point, you have a linear equation in one variable, which can therefore be solved. that's sufficient - no need to actually solve.

1. k=2000+j
2. (1+p%)k = 2400+ (1+p%)j => (1+p%)(2000+j)= 2400+(1+p%)j
i.e. (1+p%)2000 = 2400 u get P
1. k=2000+j
2. (1+p%)k = 2400+ (1+p%)j => (1+p%)(2000+j)= 2400+(1+p%)j
i.e. (1+p%)2000 = 2400 u get P

125.

(answer is E)

you can follow your gut to the conclusion that answer 1 is insufficient - i.e., that there are a ridiculously huge number of ways of making the sum total of 9500 out of a collection of 200's, 300's, and 350's. Also, #2 is clearly insufficient by itself, because there could be any number of offices (as long as it's more than ten).

taking the two together, just subtract the 3500 square feet taken up by the ten offices in question, and you have 6000 square feet left. therefore, the question is now something like this:

'is there more than one way to make 6000 out of a combination of 200's and 300's?'
(the previous sentence has been edited from its prior version, which mistakenly still considered the possibility of more 350's)

the answer to that question is definitely yes, so it's (e). if you don't see why right away, notice that you could change the number of offices, while not changing the number of square feet, just by replacing two 300-sqft offices with three 200-sqft offices (or vice versa).

126.

OA - E, and I don't know why. Any help is really appreciated.

Interest of Rate of B = 1.5A
(Ex: 15 = 1.5 X X = 15/1.5 = 10

What is A?

Lets say: Investment 1 = K
Investment 2 = P

1) (K)A = 50
(P)B = 150

(K)B/1.5 = 50
(P)B = 150

(K)B = 75
(P)B = 150

2(K)B = (P)B

2K=P

TEST IT:
If investment K is $50 then investment P is $100
$50A=50
A=1

$100B = $150
We know B = 1.5 A
$100(1.5)1 = $150

This could work....lets try another one

Investment K = $500

$500A = 50

A = 50/500
A = 10%

Investment P = $1000

$1000B = 150
B=1.5A B = 1.5(.1) = 15%
$1000
$1000(.15) = $150

This one works too!

So we don't have a concrete investment amount because there are several different possibilities.

2) INSUFFICIENT: She could've put any amount of money into these investments and we cannot calculate and exact number with this type of uncertainty. This tells us the same info a statement 1

try to think of these sorts of things in the abstract.

this advice may seem contradictory to some other advice we've given - specifically on number properties problems, on many of which we advise you to run around plugging in numbers all over the place *right away* - but it isn't: this problem, which features investments and interest rates, is *much* more conceptually accessible than are number properties problems dealing with such recondite concepts as differences of absolute values.
in general, on conceptually accessible problems (such as this one), you're better off accessing them conceptually, if at all possible.

--

let's take the 2 statements together,

thinking in the abstract, here's the problem: we have a RATIO of interest rates and a RATIO of initial principal investments, but we have no way to compute ACTUAL interest rates or principal investments.
another way of thinking about it: the interest rates could be, say, 0.02% and 0.03%, meaning that linda would have to invest a huge amount of money to accrue the given dollar amounts of interest. alternatively, the interest rates could be, say, 20% and 30%, meaning that linda would only have to invest nominal amounts of money.
therefore, still insufficient.

--

interestingly, if we have statement (1) plus the prompt, then statement (2) doesn't add any new information; in fact, we can *deduce* statement 2 from statement 1. here's how:
let the rate on A be r, and the rate on B be 1.5r.
let the principal on A be a, and the principal on B be b.
then ra = 50 and 1.5rb = 150.
the latter equation reduces to rb = 100.
therefore, since ra = 50 and rb = 100, it's clear that b is twice as big as a (either by dividing the equations, or just by inspection).

therefore, statements 1 and 2 together are the same as just statement 1 alone. since statement 1 is insufficient, both statements are still insufficient.

127.

THE ANSWER IS 34
To solve this problem you need to understand that boards are double counted 2 times. The 20th board was counted in the set "16 from the bottom", and the 16th board was counted in the set "20 from the top". So, (20-1) + (16-1) = 34.

make a diagram in which you label the boards as follows. the blue numbers count from the top, and the orange numbers count from the bottom.

1
2
3
4
.
.
.
17
18
19 16
20 15
14
13
.
.
.
3
2
1

this diagram should make it clear that the two middle boards - the one that is blue19/orange16 and the one that is blue20/orange15 - are counted twice. therefore, 20 + 16 = 36 is two greater than the actual number of boards.
thus, 34 boards.

128.

Ans = 150.

The problem tells us that it will pay a bonus "up to $10,000" so if we want to know the maximum possible bonus, we have to assume the person charged $10,000.

For the first $1,000, the person earns a 0.5% bonus.
1000 = 100%
100 = 10%
10 = 1%
5 = 0.5%
So the person earns $5 for the first $1,000 charged.

For the next $2,000 charged (between $1,000 and $3,000), the person earns a 1% bonus.
200 = 10%
20 = 1%
So the person earns $20 for the next $2,000 charged.

For the next $3,000 charged (between $3,000 and $6,000), the person earns a 1.5% bonus.
300 = 10%
30 = 1%
15 = 0.5%
So the person earns $30 + 15 = $45 for the next $3,000 charged.

For the last $4,000 charged (between $6,000 and $10,000), the person earns a 2% bonus.
400 = 10%
40 = 1%
So the person earns $40 + $40 = $80 for the last $4,000 charged.

For the full $10,000, the person earns 5 + 20 + 45 + 80 = $150.

129.

REPEAT – leave

130.
Answer is E

attack the easy statement first. that's the second statement, which given information about only one of the players.

(2) alone: INSUFFICIENT
we know that marsha drove 450 miles, leaving 1050 miles of driving for the other two. however, we know nothing about the way those 1050 miles are split up. (we do at least know that marsha didn't drive the greatest distance, because, if two people drive a total of 1050 miles, then at least one of them drives 525 miles or more)

(1) alone: INSUFFICIENT
nowhere near enough information here, because we aren't told anything about (a) the speeds of al and pablo, and (b) anything involving marsha.

together: WARNING - this is probably nowhere close to the best way to solve this problem; it's just the first thing that jumped out of my mind
we know al & pablo together drove 1050 miles.
let t be al's time, and r be al's speed. then pablo's time is t - 1, and pablo's speed is r + 5. we have
rt + (t - 1)(r + 5) = 1050
2rt - r + 5t - 5 = 1050
2rt - r + 5t = 1055
r = (1055 - 5t) / (2t - 1)

we're trying to compare rt versus (r + 5)(t - 1)
--> try to pick one really short time (so that al's additional hour makes a huge difference)
let t = 3 hours --> r = 1040/5 = 208 mi/hr
so al drives 3 hrs @ 208 mph = 624 mi
pablo drives 2 hrs @ 213 mph = 426 mi
al wins

--> try to pick one really long time (so that pablo's bigger speed matters a lot)
let t = 100 hours --> r = 555/199 which is approximately 2.8 mph

al drives 100 hrs @ approx. 2.8 mph = about 280 mi
pablo drives 99 hrs @ approx. 7.8 mph = about 780 mi
pablo wins

INSUFFICIENT

answer = e

131.

this is another twist on an old classic: these three points are in ARITHMETIC PROGRESSION, meaning that they are EQUALLY SPACED on the number line. try drawing out a number line and see for yourself: if the distance between M and J is twice the distance between M and K, then this puts K at the exact midpoint between J (on the left) and M (on the right).

whenever you have points in arithmetic progression, no matter how many of them there are, symmetry dictates that the median and the mean are the same value. in the case of this problem, the median is kate's salary, so choice (b) is actually giving us both the median and the mean of this particular set.

(a) is insufficient because it's the leftmost point, giving us no information about the spacing of the points, and therefore no information about the location of point K (= kate's salary, the only one we actually care about).

M-J = 2(M-K)

M-J=2M-2K

-M-J = -2K

2K= M+J

2(40K) = M+J

M+J= 80K

132.

Choose d = 1000 and k = 30. I chose these numbers because $600 of simple interest over two years means $300 each year, and 30% of $1000 is $300.

So now, we need to find the target value, namely the size of the investment needed to yield $2400 in interest over three years, at the same rate k.

Interest = (Principal)(rate)(time)
2400 = P(.3)(3)
P=8000/3

Now, plugging in 1000 in for d in the five answer choices only gives one match, choice E.

133.

both unknowns are 'G', so solve for 'G':
G = L + range

--

may:
range = 15
L = 4.5
G = 15 + 4.5 = 19.5

--

june:

range = 16.5
L = 6.1
G = 16.5 + 6.1 = 22.6

--

overall 'L' = 4.5 (lower of the two 'L's)
overall 'G' = 22.6 (higher of the two 'G's)
overall range = 22.6 - 4.5 = 18.1

134.

(1) only:
insufficient, because you don't know the lengths of time for which M traveled at the two different speeds.
consider the extreme cases:
if y is 0.0001 or so, then M traveled at 1.25x = 60 mph for virtually the whole trip. therefore, her time will be very close to 80% of what it would have been at x = 48 mph.
if y is 39.999 or so, then M traveled at 48 mph for virtually the whole trip. therefore, her time will be very close to 100% of what it would have been at x = 48 mph.

(2) only:
if y = 20, then M traveled 20 miles at 1.25x mph and the other 20 miles at x mph.
solve d = rt for time: t = d/r. therefore, the total time is 20/(1.25x) + 20/x = 16/x + 20/x = 36/x hours.
the time she'd have taken at a constant speed of x mph is 48/x hours.
we know that the percentage difference can be calculated:
(36/x) / (48/x) = 36/48 = 75%
(notice that there's no need to actually calculate this, unless you don't otherwise see that the x's cancel)
sufficient

ans = b

135.

1. Correct answer: (C)

   hopefully it's fairly clear, after a little reflection, that each of the *individual* statements is insufficient; they're merely statements about percentages / proportions of students *who transferred from other colleges*. that won't do to figure out percentages of the entire graduating class.
   BUT:
   let's say M is the # of males in the graduating class (total), and F is the # of females.
   then
   statement (1) says 0.33M + 0.20F were transfers;
   statement (2) says 0.25(M + F) were transfers (i.e., 25% of everybody).

   since both of these are the # of transfers, set them equal:
   0.33M + 0.20F = 0.25M + 0.25F
   0.08M = 0.05F
   this gives you the **ratio** of males to females if you continue to solve (which, of course, you don't have to)

   ...but, if you have the ratio of m : f (and there's no third gender, hopefully) that's SUFFICIENT to find the percentages.

136.

Answer D.

p (price per gallon)= d+ 4% (d) + 0.18

p= 1.04 d+0.18$

1.04d= p-0.18
d= p-0.18/1.04

Hence D

137.

Answer is c

(x-50000)*.10+ 50000*15=24000
0.10x-5000+7500=24000
0.10x=21500
x= 21500/0.10= 215000

Hence C

138.

Answer: E

so let's just grind it.

let's just say that henry's entire income this year is one dollar, so that 'what fraction of his income' just becomes 'how much'.

thus:
let x = the amount henry saves this year
then 1 - x = the amount he spends
so
next year he will have (1 + r)x dollars to spend = x + rx

the problem tells us that this quantity has to be half of (1 - x).
so
(1 - x)/2 = x + rx

double both sides: 1 - x = 2x + 2rx

segregate terms involving x from those not involving x: 1 = 3x + 2rx

factor out x: 1 = x(3 + 2r)

divide --> answer = e

139.

correct answer (c)

two ways to do the problem:
(1) use an unknown multiplier: let the original numbers of stamps be 5x for kaye and 3x for alberto. then after the exchange, kaye has 5x - 10 stamps, and alberto has 3x + 10.

therefore:
(5x - 10) / (3x + 10) = 7 / 5

cross multiply:
25x - 50 = 21x + 70
4x = 120
x = 30

plug back in to get
kaye's new total = 5x - 10 = 140
alberto's new total = 3x + 10 = 100
answer = c

--

you could also solve the problem by starting with the answer choices, and running them through the problem backwards. for instance, starting from the correct answer (c), you'd need to find two #s of stamps that are 40 apart, and are also in the ratio 7:5. those numbers are 140 and 100; you could then *undo* the exchange, finding that there were originally 150 and 90 stamps. since these numbers are indeed in the ratio 5:3 - which won't happen with any of the other answer choices - you must have started with the correct choice.

140.

The OA is E

'x percent **greater than**' Vs. 'x percent **as great as**'.

those two are different; since this is such a common point of confusion, you can rest assured that the gmat will include *wrong* answers corresponding to whichever of the two happens to be incorrect for each problem.

to wit:
'x percent **greater than**' signifies an **increase** of x percent. in other words, you take x percent of the original quantity **and add it onto the original quantity**.

'x percent **as great as**' just means x percent **of** the original quantity; you just find the percentage, no addition necessary.

if you still aren't 100% clear on the difference, think about the stark contrast between
70% greater than Z, which is *bigger* than Z (by 70 percent), and
70% as great as Z, which is *smaller* than Z (by 30 percent).

--

in this problem, it is by far easiest to **pick a smart number for 1992**, not 1994. that 1994 is mentioned first makes no difference at all; 1992 is the better choice because 1993 is given as a percent change *upon* 1992, and 1994 is given as a further percent change *upon* 1993. moreover, the variable N itself stands for 1992, giving another reason to pick a nice number for 1992. (last but not least, there's also the intuitive appeal of working forward instead of backward.) so:

1992 assets = N = 1 (no need to pick 100 here, as the percents are all multiples of 100%)
1993 assets = 1 + 400% of 1 = 5
1994 assets = 5 + 300% of 5 = 20

answer = e

141.

since both types of bars come 2 to a box, we can rephrase the question to just this: **how many chocolate bars did he buy?** (this works because the answer is just going to be double the number of packages; since it's data sufficiency, there's no good reason to waste the time doing the extra step).

so, in other words, we can ignore 'packages' and think in terms of bars instead.

--

(1)
rasheed bought 2 fewer chocolate bars than toffee bars.
so chocolate bars = x (this is what we want to find)
and toffee bars = x + 2
all we know is:
he hands out (2x/3) chocolate bars and (3x/5) toffee bars
INSUFFICIENT

(2) if c = # of chocolate bars and t = # of toffee bars, we know 2c/3 = 3t/5, which cross-multiplies to 10c = 9t.
this means that the ratio c : t is 9 : 10, but we have no idea what the actual *numbers* in the ratio are.
INSUFFICIENT

together:
taking both statements together, we have 10(x) = 9(x + 2), or (x) : (x + 2) = 9 : 10.
this is an equation with a unique solution.
SUFFICIENT (note that there is no need to solve; simply noting that there is 1 solution is good enough)

answer = c

142.
(1) Of the people in the group who support Candidate R, 58 percent are in favor of flat tax

We dont know exactly how many people are supporting R. We only know it is 45% of a x (where x is the number of people in the group).

So this means the answer is E.

143.

(1)

no indication of the size of the student body
insufficient

(2)
no differentiation between part-time and full-time students
insufficient

(together)
we still don't know anything about the # of part-time students, which is an essential contributor to the 5% increase mentioned in statement (2)
examples:
- if there are 0 part-time students in both years, then the # of full-time students has increased by 5%
- if the # of full-time students has increased from 0 to 50 but the # of part-time students has remained constant at 1000 (so that 50 is 5 percent of the enrollment), then the # of full-time students has grown by infinity%
...and anything in between

answer = e

144.

(1)

before wage increases:
jack = m + 5
mark = m

after wage increases:
jack = 1.06(m + 5)
mark = 1.06m
difference = 1.06(5)
= 5.30, but you're wasting your time if you calculate 1.06(5) (all you have to notice is that it's a constant; m drops out)
sufficient

(2)
before wage increases:
jack = 4x
mark = 3x
after wage increases:
jack = 1.06(4x) = 4.24x
mark = 1.06(3x) = 3.18x
difference = 1.06x
depends on x
insufficient

answer = a

145.

Machine A can produce in 8 hours at its rate, which is 9,000 x 8 = 72,000. 100-72 = 28,000, and 28,000/7,000 = 4 hours. Thus, I would pick A.

The Question asks us to use Machine B the least amount of time. This means we have to use Machine A the maximum number of times to achieve the goal.
Now it is given that a machine can operate a maximum of 8 hours.
Therefore the number of pencils produced in 8 hours by Machine A would be = 9000*8 = 72000

The remaining needs to be produced by machine B.
Remaining pencils that needs to be produced = 100000-72000 = 28000

The time taken by Machine B would be 28000/7000 = 4 hours

146.

(1)
no quantitative information at all.
for all we know, malik could have fed the entire 101st airborne last time. likewise, he might have made just 1 serving (or even 0.00001 serving).
insufficient

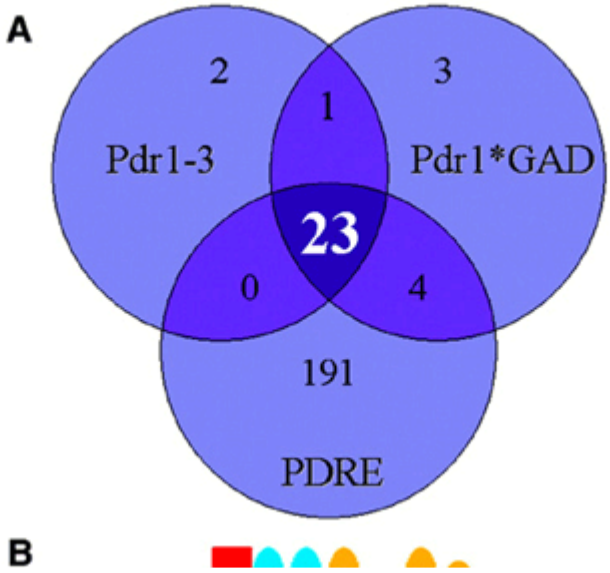
(2)
no information at all about *this* time.
insufficient

(together)
if you want, you could actually solve proportions to figure out how many servings malik made last time, then halve that, then transform back to cups of pasta. but ... why would you want to do that?
since recipes use direct proportions, statement (1) tells us that malik will require exactly half as

many cups of pasta as last time. therefore, using statement (2), we can figure out that he'll need 3 cups of pasta.

answer = c

147.



* the upper left circle (pdr1-3) will stand for set a.
* the upper right circle (pdr1*gad) will stand for set b.
* the bottom circle (pdre) will stand for set c.

--

(1) unless i'm reading this wrong, this statement is actually telling you the number you want. the 9 elements mentioned are in all three sets, and they're the only ones that are (think about this for a sec and it should sink in - if anything is in all three, then it's got to be one of those 16 in the first place, so you can be sure that you're not missing anything here). so that's definitely *sufficient*.

(2) because of statement (1) we know that 9 common elements will definitely work. if we put a 9 in the middle circle of the venn diagram above, then we have the following:
1, 7, 5 (imagine these numbers where you see '2, 1, 3' in the link)
8, 9, 9 (imagine these numbers where you see '0, 23, 4' in the link)
9 (where you see '191' in the link)

but, if you put an 8 in the middle circle, you get the following, which also works:
0, 8, 4
9, 8, 10
8

so, insufficient.

A int. B int. C is ALWAYS, ALWAYS a part of A int. B. if you don't see why this is so, construct a venn diagram.

or think about a real-life situation: "students who play football, rugby, and baseball" are clearly included in the group "students who play football and rugby".

... not only that, but statement 1 actually TELLS you that the 9 are part of the 16.
it says: (emphasis mine)
of the 16 elements *that are in both A and B, 9 elements are also in C*
-- that "of" absolutely guarantees you that the 9 are part of the 16.
so does the "also".

148.

Distance = Rate * Time, so...

90 = (v-3) * (t+1/2) - since it took half an hour longer to go upstream, and 90 = (v+3) * t.

Expand these out:

90 = vt - 3t + v/2 - 3/2
90 = vt + 3t

Subtract the first from the second:

0 = 6t - v/2 + 3/2

Solve for t in terms of v:

6t = v/2 - 3/2
t = v/12 - 1/4

Substitute into the second equation so we can solve for t:

90 = vt+3t = v(v/12-1/4)+3(v/12-1/4)
= v^2/12-v/4+v/4-3/4
= v^2/12 - 3/4

v = sqrt((90+3/4)*12)
= sqrt(363/4*12)
= sqrt(1089) = 33

And since t = v/12-1/4:
t = 33/12-1/4 = 33/12-3/12 = 30/12 = 5/2. It took 2 1/2 hours downstream and 3 hours upstream.

149.

3/80 is the ratio we begin with (TAs / Students). We know that our ultimate ratio of TAs to students has to exceed this ratio.
We're told the course in question has 5 TAs ---> 5/x (TAs / Unknown Number of Students)
Solving for the unknown number of students can be done by setting up:
3/80 = 5/x ---> x = 133.333(333,etc.).
So, when x = 133.333(333,etc.), 5/x = 3/80. We want x such that 5/x > 3/80. Using an x < 133.333(333,etc.) would help us attain this. More specifically, we want the highest integer value (since we can't have .333(333,etc.) of a student...). This value is 133.

150.

The 'rephrased question' is what is 'x'. therefore statement 1 enables you to answer this as 350 miles. Statement 2 does not help to establish 'x'

So correct answer is A.

Time taken to travel x miles = (x/50) if we calculate X that would be sufficient to calculate the time. As Shaji mentioned the rephrased question is what is x?

Information from the question - he drove x miles at 50 m/hr and the rest 60m/hr.

Statement (1)

Total distance - 530 miles
Total time = 10 hours assume he drove for t1 hrs at 50m/hr and t2 hrs at 60m/hr So

t1+t2 = 10

x/50 + (530-x)/60 = 10 ---from this euqation x can be calculated and so the time.
SUFFICIENT

Statement (2)

Assume t1, t2 and t be the time time to travel x miles, the rest and the total time

So, t1 + t2 = t...(1)

t1 = t2 +4..(2) because Julio took 4 more hours to travel x miles than the rest.

Putting t1 from (2) in (1) t2 + t2+4 = t, we do not have the information about ehat the total time is, total distance travelled or average speed.

INSUFFICIENT. Hence the answer is (A)

151.

x + y = 1

If y>=0.15, then try some:
If y=0.15, x = 0.85 in which case, no, x is not less than 0.8.
If y=0.3, then x=0.7, in which case, yes, x is less than 0.8.
Contradictory answers = indufficient.

y = 1-x
If C >=7.30, then try some:
If C=7.30, then 7.3 = 6.5x + 8.5(1-x)
7.3 = 6.5x + 8.5 - 8.5x
-1.2 = -2x
1.2/2 = x
x = 0.6, so yes, x < 0.8.

What happens if I increase C? I can either try a larger number or use logic to figure out if x will go up or down - totally up to you on the real thing.

If x+y=1, and I need to create a larger C, I have to make x smaller and y larger (because I multiply y by 8.5 in the formula while only multiplying x by 6.5). So, x will decreas as C increases. As a result, I can always say that x < 0.8. Sufficient.

152.

answer is D.

If P=Gross Profit & R=Revenue; the question is : What is P/R as a percentage.

Statement 1 gives a definitive answer of 25%

Statement 2 gives a definitive answer of 25%

Therefore each statement is sufficient by themselves, therefore the correct answer is D.

153.

n - Number of people
p - price of admission.

For part A) you can create the equation

$n(p) = (p - 0.75)(n + 100)$
$np = np + 100p - .75n - 75.$
$100p - .75n = 75.$

You only have one equation and two variables so you cannot solve for n.

For part B) you can create the equation.

$n(p) = (p + 1.5)(n-100)$
$np = np -100p + 1.5n - 150$
$1.5n - 100p = 150.$

Again B is insufficient because two variables and one equation.

Combine A+B, you immediately see that the two equations are distinct to each other. 2 equations 2 variables you know you can solve for n. So C is the answer.

Lets assume, the fee be x/person and the no. of people attended be y

from (1) Total money the club made = (x- 0.75)(y+100)
from (2) ..... = (x+1.50)(y-100)

from (1) & (2)

(x-3/4)(y+100) = (x+3/2)(y-100)

(4x-3)(y+100)/4 = (2x+3)(y-100)/2

4xy + 400x - 3y - 300 = 4xy-400x + 6y - 600

154.

ans is b

first convert m^3 to cm^3. Since there are 100cm in 1 m,
1 m^3 * (100^3 cm^3/ 1 m^3).
Then, since 800 kg = 800,000 grams (since there are 1000 grams in 1 kg),
1000000 cm^3/ 800000 g. This reduces to 10/8 = 5/4.

5/4 = x/1 to get x = 1.25

155.

Clearly, 1) and 2) each by itself is not sufficient to answer.

Combining,
FD-900; SD-800
UNFD-100;UNSC-200

But nothing tells us that the 100 from UNFD are among the 200 in UNSD. So there is not enough info to answer the question.

To me, this is an overlapping sets problem best solved with a two-circle Venn Diagram. Circle #1 is first day attendants, circle #2 is second day attendants, the overlap is attendants for both days, and Neither is the space outside the diagram.

The information from the original problem plus statement (1) give you the first circle (900). Insufficient to solve for Neither.
The information from the original problem plus statement (2) give you the second circle (800). Also Insufficient to solve for Neither.

Together, you still have no idea how many individuals addended Both days. Since the proper formula for such a situation is
Total = Group 1 + Group 2 - Both + Neither, in our case we have
1000 = 900 + 800 - Both + Neither.
Since we are still left with two variables (B and N), the correct answer is E.

156.

6 mcs = 1/12 job per day
?= 1/8 job per day

(6*1/8)/(1/12)=9mcs

Therefore 3 more than the number of mcs already operating would be required

157.

The first step is translating the information given and setting up the equations correctly.

Let Ra = rate of A painting the tank alone
Rb = rate of B painting the tank alone
Rc = rate of C painting the tank alone

We can use the work formula to express the information in the problem.
rate * time = work

When different people work together, we can combine/add their rates.
(1) A and B working together: (Ra + Rb)(5/6) = 1
(2) A and C working together: (Ra + Rc)(3/2) = 1
(3) B and C working together: (Rb + Rc)(2)= 1

Now the question is asking for t in the expression: (Ra + Rb + Rc)(t) = 1
To find out t, we need to find Ra + Rb + Rc.

Let's use the equations from the data and add them together:
(1) can be manipulated to be (Ra + Rb) = 6/5
(2) can be manipulated to be (Ra + Rc) = 2/3
(3) can be manipulated to be (Rb + Rc) = 1/2

When we add the three equations together, we get 2Ra + 2Rb + 2Rc = 71/30.
If Ra + Rb + Rc = 71/60, then t = 60/71.

158.

Answer is (D).

Solution:

According to question, we try to derive the number of people then we come to know that there are n * (n+1) people are there.

for example there are 3 friends of Mary, so now each of the friend would ask help to their respective 3 friends.
Mary's friends = 3
Friends's friends = 3 X 3
Therefore total friends = 12 i.e 3 X 4

So now with statement 1: 1/16 of total money is donated by Mary's n friends.

On the first look, its really hard to formulate any formula by just looking at the statement 1. so lets better try with statement 2.

On looking at statement 2,

we comet to know that n * (n + 1) * 500 = 120,000. So n = 15

So, statement (B) is alone sufficient.

Now, again looks at statement 1 which states that 1/16 of total money is mary's friend. That is 15/16 of total money is deposited by mary's friends' friends. Now, it looks very clear that there are 15 friends of mary who has deposited 1/16 of money.

1/16 of total money means 1/16 of totals person who donated the money. 1/16 persons means 1/16 of n * (n + 1). So, now as persons are divided into 16 groups (because value is 1/16) so n + 1 = 16. (Remember n can't be equal to 16, as there are only 16 groups).

So n = 15.

So both statements are alone able to satisfy the answer.