GMAT CLUB FLASHCARDS

Compound Interest

- If $20,000 is invested at 12% annual interest, compounded quarterly, what is the balance after 1 year?

Compound Interest | Answers

- Compound Interest formula:

$$= principal \times \left(1 + \frac{Interest}{C}\right)^{years \times c}$$

where **C** is the number of periods

- $20{,}000 \times \left(1 + \frac{0.12}{4}\right)^{1 \times 4} = 20{,}000 \times (1.03)^4$
- 1.03 to the 4th power is 1.1255
- Times 20,000, that's $22,510
- (as opposed to 22,400 for simple interest)

Mixtures

- 14 liters of apple juice is mixed with cranberry juice. If the resulting mix contains 65% of cranberry juice, how many liters of the mix were produced?

Mixtures | Answers

- Mixture problems require attention to details to both the information given and the question.
- We know that the 14 liters of apple juice is 35% (100%-65%) of the new mixture.
- Construct an "X":
  - 14 liters----------35%
  - X liters ----------100%
- $\frac{14\times100}{35} = 40$ liters

Work Problems

- What is the formula for a work problem?

Work Problems | Answers

- The key to solving the work problems, is setting the equation correctly. The work formula is based on the principle of work rates (inverse of the time it would take to complete the job). The rate almost always will be $\frac{1}{time\ (of\ hours, days, etc)}$
- Formula: Sum of the Rates of Workers = the combined rate
- $\frac{1}{W_1} + \frac{1}{W_2} = \frac{1}{C}$; where W is time required by workers 1 and 2 to complete the job and C is the time required for both workers working together (Combined)

Work Problems 2

- Robert working alone can unload a truck in 8 hours. Doug, on the other hand, can unload the same truck in 6 hours. If both are hired together, how much time will it take Robert and Doug to unload the truck working together?

Work Problems 2 | Answers

- Using the Work formula: $\frac{1}{R} + \frac{1}{D} = \frac{1}{C}$
- $\frac{1}{8} + \frac{1}{6} = \frac{1}{C}$
- $\frac{7}{24} = \frac{1}{C}$
- C = $\frac{24}{7} = 3.4$ hours (approximately)

Group Problems

- Out of 90 conference attendees, 50 registered for the basic workshop and 60 signed up for the advanced workshop. If 20 attendees have not signed up for a workshop yet, how many signed up for both advanced and basic workshops?

Group Problems | Answers

- The best and easiest approach to solving this type of problems is using the both/neither formula (alternative option is a Venn diagram).
- Group1 + Group2 + Neither – Both = Total
- 50 + 60 + 20 – Both = 90
- 130 – Both = 90
- Both = 40
- The key is to memorize the formula and one sample question so you can plug in numbers on the test

Group Problems 2

- The office of 120 is split between male and female employees at the ratio of 3:5. If 40% of the employees are married and 20 of the married employees in the office are men, how many of the women working in the office are single?

Group Problems 2 | Answers

- To answer this question the fastest, we can put this table together:

	Male	Female	Total
Married	20	X	48
Single	X – 3	X – 75	72
Total	45	75	120

- Thus 20 + X = 48; X = 28. We can do the rest of the math and fill out the entire table to make sure your calculations are correct

Volume/Mixture Problems (Hard)

- If a farmer sells 15 of his chickens, his stock of feed will last for 4 more days than planned, but if he buys 20 more chickens, he will run out of feed 3 days earlier than planned. If no chickens are sold or bought, the farmer will be exactly on schedule. How many chickens does the farmer have?
  - 12
  - 24
  - 48
  - 55
  - 60

Volume/Mixture Problems | Answers

- Very hard problem. Several solutions exist; this one is probably not the most correct but the quickest:
- Let X be the number of chickens and Y be the days they can survive on the current feed:
- (x-15)(y+4)=(x+20)(y-3)
- $xy + 4x - 15y - 60 = xy - 3x + 20y - 60$
- $4x - 15y = 20y - 3x$
- $7x = 35y \; or \; x = 5y$
- Solving the first equation, we get x=60 and y=12

Counting Problems (Ultra Hard)

- In a game of chess, the moves of whites and blacks alternate with whites having the first move. During a chess tournament, whites have made 2319 moves altogether while blacks have made 2315 moves. If in any game the side that made the last move did not lose, which of the following can be true about the tournament?
  - I. Blacks lost 5 games
  - II. Blacks won more games than whites
  - III. All games ended in a draw

Counting Problems | Answers

- From the stem it follows that there were only 4 games in which whites had the last move. These 4 games were responsible for the difference in the total number of moves made by whites and blacks during the tournament. We know that these 4 games were not won by blacks (but they could well have ended in a draw). All the other games could have been won by blacks or ended in a draw. **Thus, scenarios II and III are possible.**
- Scenario I is impossible. It means that there were at least 5 games in which whites had the last move. If this were true then the difference between the total number of moves of whites and blacks should be at least 5. In fact, it's only 4.

Distance (Ultra Hard)

- A swimmer makes a round trip up and down the river which takes her X hours. If the next day she swims the same distance with the same speed in still water, which takes her Y hours, which of the following statements is true?
  - X>Y
  - X<Y
  - X=Y
  - $X = \frac{1}{2} \times Y$

Distance | Answers

- Pick numbers and then check them against the options. Take 12 km as the distance traveled up/down the river, and assume the swimmer's speed to be 4 km/h; the current being 2 km/h, which means 6 km/h down the river and 2 km/h up the river. Going upriver takes 2 hours, return journey takes 6, thus a total of 8 hours. In still water, 24 km requires 6 hours. Thus X=8 and Y=6.
- Plug these into the answer choices. (8 > 6).
- **The correct answer is A**

Percent

- If a price was increased by x% and then decreased by y%, is the new price higher than the original?
  - x>y
  - x=1.2y

Percent | Answers

- Let P denote the original price.
- Statement (1) by itself is insufficient. If x is much larger than y, the new price is higher than the original. But if x is only marginally larger, the new price is lower. For example, if x=20 and y=19, the new price is P*1.2*0.81=0.97P <P.
- Statement (2) by itself is insufficient. Use the same reasoning. If y is large, the new price is small (if y=100 , the new price is 0). If y is small, the new price is higher than the original (if x=12 and y=10, the new price is P*1.12*0.9= P*1.008 > P).
- Statements (1) and (2) combined are insufficient. Adding S1 to S2 provides no new information.
- The correct answer is E.

Rate

- A certain bacteria colony doubles in size every day for 20 days, at which point it reaches the limit of its habitat and can no longer grow. If two bacteria colonies start growing simultaneously, how many days will it take them to reach the habitat's limit?
  - 6.33
  - 7.5
  - 10
  - 15
  - 19

Rate | Answers

- We know that the bacteria colony doubles in size every day for 20 days. Therefore on the second day it is double the size of the first day, and so on. Similarly, on the 20^{th} day, it is at 100% of capacity, therefore, on the 19^{th} day, it will be at 50%. Since we have 2 colonies, both will be occupying half of the habitat by the 19^{th} day. Alternatively:

  1 colony = $x \times 2^{20}$; 2 colonies = $\frac{x \times 2^{20}}{2} = x \times 2^{19}$

- **The correct answer is E. 19 days.**