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Q1:

The population of City X is 50 percent of the population of City Y. The population of City X is what percent of the total population of City X and City Y?

- A. 25%
- B.  $(33 \frac{1}{3})\%$
- C. 40%
- D. 50%
- E.  $(66 \frac{2}{3})\%$

Answer:

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Q2:

What is the greatest prime factor of  $2^{100} - 2^{96}$ ?

- A. 2
- B. 3
- C. 5
- D. 7
- E. 11

Answer:

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Q3:

How many liters of apple juice were added to the cranberry juice in a certain container?

- (1) The amount of apple juice that was added was  $\frac{3}{2}$  the amount of cranberry juice in the container.
- (2) There were 5 liters of cranberry juice in the container.

- A. Statement (1) **ALONE** is sufficient, but statement (2) alone is not sufficient.
- B. Statement (2) **ALONE** is sufficient, but statement (1) alone is not sufficient.
- C. **BOTH** statements **TOGETHER** are sufficient, but **NEITHER** statement **ALONE** is sufficient.
- D. **EACH** statement **ALONE** is sufficient.
- E. Statements (1) and (2) **TOGETHER** are **NOT** sufficient.

Answer:

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Q4:

In a demographic study, the population and total income of a certain region were estimated from other data, and both estimates had lower and upper limits. At the time of the estimates, was the per capita income for the region greater than \$16,500?

- (1) The lower limit for the estimate of the population was 330,000 people.
- (2) The lower limit for the estimate of the total income was \$5,500,000,000.

- A. Statement (1) **ALONE** is sufficient, but statement (2) alone is not sufficient.
- B. Statement (2) **ALONE** is sufficient, but statement (1) alone is not sufficient.
- C. **BOTH** statements **TOGETHER** are sufficient, but **NEITHER** statement **ALONE** is sufficient.
- D. **EACH** statement **ALONE** is sufficient.
- E. Statements (1) and (2) **TOGETHER** are **NOT** sufficient.

Answer:

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Q5:

Is  $|x| < 1$ ?

- (1)  $|x + 1| = 2|x - 1|$
- (2)  $|x - 3| \neq 0$

- A. Statement (1) **ALONE** is sufficient, but statement (2) alone is not sufficient.
- B. Statement (2) **ALONE** is sufficient, but statement (1) alone is not sufficient.
- C. **BOTH** statements **TOGETHER** are sufficient, but **NEITHER** statement **ALONE** is sufficient.
- D. **EACH** statement **ALONE** is sufficient.
- E. Statements (1) and (2) **TOGETHER** are **NOT** sufficient.

Answer:

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Q6:

A box contains 10 light bulbs, fewer than half of which are defective. Two bulbs are to be drawn simultaneously from the box. If  $n$  of the bulbs in box are defective, what is the value of  $n$ ?

- (1) The probability that the two bulbs to be drawn will be defective is  $1/15$ .
- (2) The probability that one of the bulbs to be drawn will be defective and the other will not be defective is  $7/15$ .

- A. Statement (1) **ALONE** is sufficient, but statement (2) alone is not sufficient.
- B. Statement (2) **ALONE** is sufficient, but statement (1) alone is not sufficient.
- C. **BOTH** statements **TOGETHER** are sufficient, but **NEITHER** statement **ALONE** is sufficient.
- D. **EACH** statement **ALONE** is sufficient.
- E. Statements (1) and (2) **TOGETHER** are **NOT** sufficient.

Answer:

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Q7:

There are 11 women and 9 men in a certain club. If the club is to select a committee of 2 women and 2 men, how many different such committees are possible?

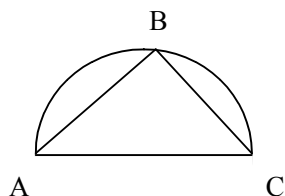
- A. 120
- B. 720
- C. 1,060

- D. 1,520
- E. 1,980

Answer:

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Q8:



In the figure shown, the triangle is inscribed in the semicircle. If the length of line segment AB is 8 and the length of line segment BC is 6, what is the length of arc ABC?

- A.  $15\pi$
- B.  $12\pi$
- C.  $10\pi$
- D.  $7\pi$
- E.  $5\pi$

Answer:

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Q9:

If  $5x = 2y$  and  $xy \neq 0$ , then is what percent of  $y$ ?

- A. 2%
- B. 4%
- C. 10%
- D. 40%
- E. 50%

Answer:

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Q10:

Six cards numbered from 1 to 6 are placed in an empty bowl. First one card is drawn and then put back into the bowl; then a second card is drawn. If the cards are drawn at random and if the sum of the numbers on the cards is 8, what is the probability that one of the two cards drawn is numbered 5?

- F.  $\frac{1}{6}$
- G.  $\frac{1}{5}$
- H.  $\frac{1}{3}$

- I.  $\frac{2}{5}$   
J.  $\frac{2}{3}$

Answer:

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Q11:

The product of the units digit, the tens digit, and the hundreds digit of the positive integer  $m$  is 96. What is the units digit of  $m$ ?

- (1)  $m$  is odd.  
(2) The hundreds digit of  $m$  is 8.

- A. Statement (1) **ALONE** is sufficient, but statement (2) alone is not sufficient.  
B. Statement (2) **ALONE** is sufficient, but statement (1) alone is not sufficient.  
C. **BOTH** statements **TOGETHER** are sufficient, but **NEITHER** statement **ALONE** is sufficient.  
D. **EACH** statement **ALONE** is sufficient.  
E. Statements (1) and (2) **TOGETHER** are **NOT** sufficient.

Answer:

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Q12:

Division R of Company Q has 1,000 employees. What is the average (arithmetic mean) annual salary of the employees at Company Q?

- (1) The average annual salary of the employees in Division R is \$30,000.  
(2) The average annual salary of the employees at Company Q who are not in Division R is \$35,000.

- A. Statement (1) **ALONE** is sufficient, but statement (2) alone is not sufficient.  
B. Statement (2) **ALONE** is sufficient, but statement (1) alone is not sufficient.  
C. **BOTH** statements **TOGETHER** are sufficient, but **NEITHER** statement **ALONE** is sufficient.  
D. **EACH** statement **ALONE** is sufficient.  
E. Statements (1) and (2) **TOGETHER** are **NOT** sufficient.

Answer:

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Q13:

The sequence  $a_1, a_2, \dots, a_n, \dots$  is such that  $a_n = 2a_{n-1} - x$  for all positive integers  $n \geq 2$  and for certain number  $x$ . If  $a_5 = 99$  and  $a_3 = 27$ , what is the value of  $x$ ?

- A. 3  
B. 9

- C. 18
- D. 36
- E. 45

Answer:

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Q14:

Box W and Box V each contain several blue sticks and red sticks, and all of the red sticks have the same length. The length of each red stick is 18 inches less than the average length of the sticks in Box W and 6 inches greater than the average length of the sticks in Box V. What is the average (arithmetic mean) length, in inches, of the sticks in Box W minus the average length, in inches, of the sticks in Box V?

- A. 3
- B. 6
- C. 12
- D. 18
- E. 24

Answer:

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Q15:

If  $x \neq 0$ , then  $(x + 1/x)^2 - (x - 1/x)^2 =$

- A.  $1/x$
- B.  $x$
- C. 1
- D. 2
- E. 4

Answer:

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Q16:

If  $m$ ,  $p$ , and  $t$  are positive integers and  $m < p < t$ , is the product  $mpt$  an even integer?

- (1)  $t - p = p - m$
- (2)  $t - m = 16$

- A. Statement (1) **ALONE** is sufficient, but statement (2) alone is not sufficient.
- B. Statement (2) **ALONE** is sufficient, but statement (1) alone is not sufficient.
- C. **BOTH** statements **TOGETHER** are sufficient, but **NEITHER** statement **ALONE** is sufficient.
- D. **EACH** statement **ALONE** is sufficient.
- E. Statements (1) and (2) **TOGETHER** are **NOT** sufficient.

Answer:

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Q17:

If a certain coin is flipped, the probability that the coin will land heads is  $1/2$ . If the coin is

flipped 5 times, what is the probability that it will land heads up on the first 3 flips and not on the last 2 flips?

- A.  $3/5$
- B.  $1/2$
- C.  $1/5$
- D.  $1/8$
- E.  $1/32$

Answer:

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Q18:

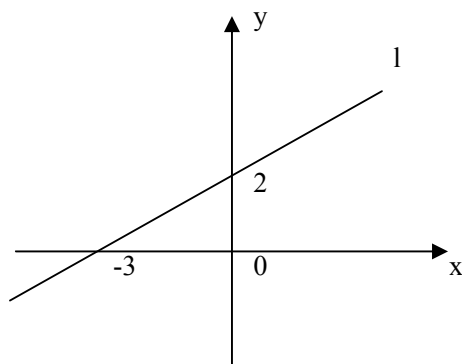
The function  $f$  is defined by  $f(x) = \sqrt{x} - 10$  for all positive numbers  $x$ . If  $u = f(t)$  for some positive numbers  $t$  and  $u$ . What is  $t$  in terms of  $u$ ?

- A.  $\sqrt{u+10}$
- B.  $(\sqrt{u} + 10)^2$
- C.  $\sqrt{u^2+10}$
- D.  $(u + 10)^2$
- E.  $(u^2 + 10)^2$

Answer:

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Q19:



The graph of which of the following equations is a straight line that is parallel to line  $l$  in the figure above?

- A.  $3y - 2x = 0$
- B.  $3y + 2x = 0$
- C.  $3y + 2x = 6$
- D.  $2y - 3x = 6$
- E.  $2y + 3x = -6$

Answer:

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Q20:

What is the total number of executives at Company P?

- (1) The number of male executives is  $\frac{3}{5}$  the number of female executives.  
 (2) There are 4 more female executives than male executives.

- A. Statement (1) **ALONE** is sufficient, but statement (2) alone is not sufficient.  
 B. Statement (2) **ALONE** is sufficient, but statement (1) alone is not sufficient.  
 C. **BOTH** statements **TOGETHER** are sufficient, but **NEITHER** statement **ALONE** is sufficient.  
 D. **EACH** statement **ALONE** is sufficient.  
 E. Statements (1) and (2) **TOGETHER** are **NOT** sufficient.

Answer:

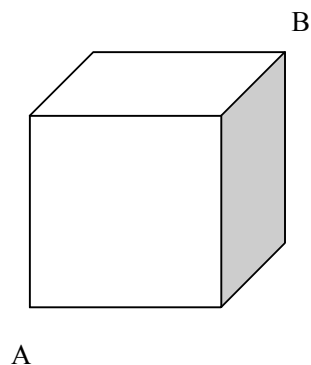
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 Q21:

The ratio of the number of boys to the number of girls in a certain school club is 3 : 4. If there are 5 more girls than boys in the club, how many girls are in the club?

- A. 7  
 B. 8  
 C. 12  
 D. 15  
 E. 20

Answer:

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 Q22:



What is the volume of the cube above?

- (1) The surface area of the cube is 600 square inches.  
 (2) The length of diagonal AB is  $10\sqrt{3}$  inches.

- A. Statement (1) **ALONE** is sufficient, but statement (2) alone is not sufficient.  
 B. Statement (2) **ALONE** is sufficient, but statement (1) alone is not sufficient.  
 C. **BOTH** statements **TOGETHER** are sufficient, but **NEITHER** statement **ALONE** is sufficient.  
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 E. Statements (1) and (2) **TOGETHER** are **NOT** sufficient.

Answer:

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Q23:

If  $x$  and  $y$  are positive integers, and  $x^3y^4 = 2,000$ , which of the following is the value of  $xy$ ?

- A. 2
- B. 4
- C. 8
- D. 10
- E. 20

Answer:

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Q24:

If  $ab = 1$ , what is the value of  $(axb)(ayb)$ ?

- (1)  $ax = by = 2$
- (2)  $2xy = 4$

- A. Statement (1) **ALONE** is sufficient, but statement (2) alone is not sufficient.
- B. Statement (2) **ALONE** is sufficient, but statement (1) alone is not sufficient.
- C. **BOTH** statements **TOGETHER** are sufficient, but **NEITHER** statement **ALONE** is sufficient.
- D. **EACH** statement **ALONE** is sufficient.
- E. Statements (1) and (2) **TOGETHER** are **NOT** sufficient.

Answer:

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Q25:

Company P had 15 percent more employees in December than it had in January. If Company P had 460 employees in December, how many employees did it have in January?

- A. 391
- B. 400
- C. 410
- D. 423
- E. 445

Answer:

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Q26:

If positive integer  $x$  is a multiple of 6 and positive integer  $y$  is a multiple of 14, is  $xy$  a multiple of 105?

- (1)  $x$  is a multiple of 9.
- (2)  $y$  is a multiple of 25.

- A. Statement (1) **ALONE** is sufficient, but statement (2) alone is not sufficient.
- B. Statement (2) **ALONE** is sufficient, but statement (1) alone is not sufficient.
- C. **BOTH** statements **TOGETHER** are sufficient, but **NEITHER** statement **ALONE** is

sufficient.

D. **EACH** statement **ALONE** is sufficient.

E. Statements (1) and (2) **TOGETHER** are **NOT** sufficient.

Answer:

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Q27:

R, S, T, and U are points on a line, and U is the midpoint of line segment ST. If the lengths of line segments RS, RT, and ST are 20, 4, and 24, respectively. What is the length of line segment RU?

- A. 6
- B. 8
- C. 12
- D. 14
- E. 16

Answer:

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Q28:

Each of the 30 boxes in a certain shipment with either 10 pounds or 20 pounds, and the average (arithmetic mean) weight of the boxes in the shipment is 18 pounds. If the average weight of the boxes in the shipment is to be reduced to 14 pounds by removing some of the 20-pound boxes, how many 20-pound boxes must be removed?

- A. 4
- B. 6
- C. 10
- D. 20
- E. 24

Answer:

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Q29:

The sum of all the integers  $k$  such that  $-26 < k < 24$  is

- A. 0
- B. -2
- C. -25
- D. -49
- E. -51

Answer:

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Q30:

A rectangular photograph is surrounded by a border that is 1 inch wide on each side. The total area of the photograph and the border is  $M$  square inches. If the border had been 2 inches wide on each side, the total area would have been  $(M + 52)$  square inches. What is the perimeter of the

photograph, in inches?

- A. 34
- B. 36
- C. 38
- D. 40
- E. 42

Answer:

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Q31:

A small, rectangular park has a perimeter of 560 feet and a diagonal measurement of 200 feet. What is its area, in square feet?

- A. 19,200
- B. 19,600
- C. 20,000
- D. 20,400
- E. 20,800

Answer:

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Q32:

Seven different numbers are selected from the integers 1 to 100, and each number is divided by 7. What is the sum of the remainders?

- (1) The range of the seven remainders is 6.
- (2) The seven numbers selected are consecutive integers.

- A. Statement (1) **ALONE** is sufficient, but statement (2) alone is not sufficient.
- B. Statement (2) **ALONE** is sufficient, but statement (1) alone is not sufficient.
- C. **BOTH** statements **TOGETHER** are sufficient, but **NEITHER** statement **ALONE** is sufficient.
- D. **EACH** statement **ALONE** is sufficient.
- E. Statements (1) and (2) **TOGETHER** are **NOT** sufficient.

Answer:

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Q33:

150, 200, 250, n

Which of the following could be the median of the 4 integers listed above?

- I. 175
- II. 215
- III. 235

- A. I only
- B. II only
- C. I and II only
- D. II and III only
- E. I, II, and III

Answer:

Q34:

The operation  $\Theta$  is defined by  $x \Theta y = \frac{1}{x} + \frac{1}{y}$  for all nonzero numbers  $x$  and  $y$ . If  $z$  is a number greater than 1, which of the following must be true?

- I.  $x \Theta (-z) = 0$
- II.  $z \Theta \frac{z}{z-1} = 1$
- III.  $\frac{2}{z} \Theta \frac{2}{z} = z$

- A. I only
- B. I and II only
- C. I and III only
- D. II and III only
- E. I, II, and III

Answer:

Q35:

If  $xy \neq 0$  and  $x^2y^2 - xy = 6$ , which of the following could be  $y$  in terms of  $x$ ?

- I.  $1/(2x)$
- II.  $-2/x$
- III.  $3/x$

- A. I only
- B. II only
- C. I and II
- D. I and III
- E. II and III

Answer:

Q36:

If a, b, c, and d are positive integers, is  $(a/b)(c/d) > c/b$ ?

(1)  $c > b$

(2)  $a > d$

A. Statement (1) **ALONE** is sufficient, but statement (2) alone is not sufficient.

B. Statement (2) **ALONE** is sufficient, but statement (1) alone is not sufficient.

C. **BOTH** statements **TOGETHER** are sufficient, but **NEITHER** statement **ALONE** is sufficient.

D. **EACH** statement **ALONE** is sufficient.

E. Statements (1) and (2) **TOGETHER** are **NOT** sufficient.

Answer:

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Q37:

In a meeting of 3 representatives from each of 6 different companies, each person shook hands with every person not from his or her own company. If the representatives did not shake hands with people from their own company, how many handshakes took place?

A. 45

B. 135

C. 144

D. 270

E. 288

Answer:

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Answer:

BCCEC, DEEDD, AEAE, EEDAC, EDDDB, BBDDD, ABCEE, BB