

Math Section

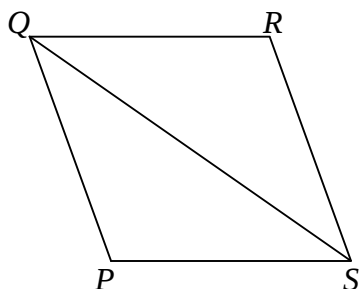
Q1:

When 20 is divided by the positive integer k , the remainder is $k - 2$. Which of the following is a possible value of k ?

- A. 8
- B. 9
- C. 10
- D. 11
- E. 12

Answer:

Q2:



In the figure above, is quadrilateral $PQRS$ a parallelogram?

- (1) The area of $\triangle PQS$ is equal to the area of $\triangle QRS$.
- (2) $QR = RS$

- 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:

Q3:

If n is an integer and $x^n - x^{-n} = 0$, what is the value of x ?

- (1) x is an integer.
- (2) $n \neq 0$

- 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.

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Answer:

Q4:

If $xy = 165$, where x and y are positive integers and $x > y$, what is the least possible value of $x - y$?

- A. 2
- B. 4
- C. 8
- D. 15
- E. 28

Answer:

Q5:

According to a survey, 93 percent of teenagers have used a computer to play games, 89 percent have used a computer to write reports, and 5 percent have not used a computer for either of these purposes. What percent of the teenagers in the survey have used a computer both to play games and to write reports?

- A. 82%
- B. 87%
- C. 89%
- D. 92%
- E. 95%

Answer:

Q6:

The value of $-3 + \sqrt{9 - k}$ is positive for which of the following values of k ?

- I. -1
- II. 0
- III. 1

- A. None
- B. I only
- C. II only
- D. III only
- E. I and III

Answer:

Q7:

There were 2 apples and 5 bananas in a basket. After additional apples and bananas were placed in the basket, the ratio of the number of apples to the number of bananas was $\frac{1}{2}$.

How many apples were added?

- (1) The number of apples added was $\frac{2}{3}$ the number of bananas added.
- (2) A total of 5 apples and bananas were added.

- 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:

Q8:

S is a set of points in the plane. How many distinct triangles can be drawn that have three of the points in S as vertices?

- (1) The number of distinct points in S is 5.
- (2) No three of the points in S are collinear.

- 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.
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Answer:

Q9:

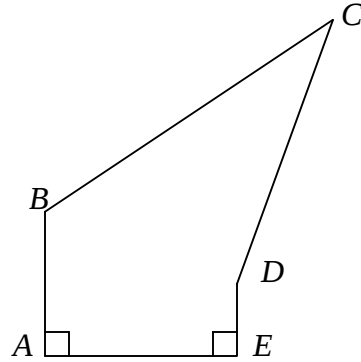
A total of 100 customers purchased books at a certain bookstore last week. If these customers purchased a total of 200 books, how many of the customers purchased only 1 book each?

- (1) None of the customers purchased more than 3 books.
- (2) 20 of the customers purchased only 2 books each.

- 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.
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Answer:

Q10:



In the figure, $AB = AE = 8$, $BC = CD = 13$, and $DE = 2$. What is the area of region $ABCDE$?

- A. 76
- B. 84
- C. 92
- D. 100
- E. 108

Answer:

Q11:

A certain business produced x rakes each month from November through February and shipped $\frac{x}{2}$ rakes at the beginning of each month from March through October. The business paid no storage costs for the rakes from November through February, but it paid storage costs of \$0.10 per rake each month from March through October for the rakes that had not been shipped. In terms of x , what was the total storage cost, in dollars, that the business paid for the rakes for the 12 months from November through October?

- A. $0.40x$
- B. $1.20x$
- C. $1.40x$
- D. $1.60x$
- E. $3.20x$

Answer:

Q12:

If the integer k is a multiple of 3, which of the following is also a multiple of 3 ?

- A. $k + 2$
- B. $2k + 8$
- C. $3k + 5$
- D. $4k + 4$
- E. $5k + 12$

Answer:

Q13:

For any positive integer x , the 2-height of x is defined to be the greatest nonnegative integer n such that 2^n is a factor of x . If k and m are positive integers, is the 2-height of k greater than the 2-height of m ?

- (1) $k > m$
- (2) $\frac{k}{m}$ is an even integer.

- 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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Answer:

Q14:

If $4x < x < x^3 < x^2$, which of the following is a possible value of x ?

- A. -2
- B. $-\frac{3}{2}$
- C. -1
- D. $-\frac{1}{2}$
- E. 0

Answer:

Q15:

What was the range of the selling prices of the 30 wallets sold by a certain store yesterday?

- (1) $\frac{1}{3}$ of the wallets had a selling price of \$24 each.
- (2) The lowest selling price of the wallets was $\frac{1}{3}$ the highest selling price of the wallets.

- 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.
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Answer:

Q16:

On a certain nonstop trip, Marta averaged x miles per hour for 2 hours and y miles per hour for the remaining 3 hours. What was her average speed, in miles per hour, for the entire trip?

(1) $2x + 3y = 280$

(2) $y = x + 10$

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

Answer:

Q17:

In a box of 12 pens, a total of 3 are defective. If a customer buys 2 pens selected at random from the box, what is the probability that neither pen will be defective?

A. $\frac{1}{6}$

B. $\frac{2}{9}$

C. $\frac{6}{11}$

D. $\frac{9}{16}$

E. $\frac{3}{4}$

Answer:

Q18:

A scientist recorded the number of eggs in each of 10 birds' nests. What was the standard deviation of the numbers of eggs in the 10 nests?

(1) The average (arithmetic mean) number of eggs for the 10 nests was 4.

(2) Each of the 10 nests contained the same number of eggs.

- 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.
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Answer:

Q19:

If p , r , s , and t are nonzero integers, is $\frac{p}{r} = \frac{s}{t}$?

- (1) $s = 3p$ and $t = 3r$.
- (2) $3p = 2r$ and $3s = 2t$.

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- 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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Answer:

Q20:

If $a_1 = 1$ and $a_{n+1} = 1 + \frac{1}{a_n}$ for all $n \geq 1$, what is the value of a_5 ?

- A. $\frac{3}{8}$
- B. $\frac{5}{8}$
- C. $\frac{8}{5}$
- D. $\frac{5}{3}$
- E. $\frac{8}{3}$

Answer:

Q21:

A toy store's gross profit on a computer game was 10 percent of the cost of the game. If the store increased the selling price of the game from \$44 to \$46 and the cost of the game remained the same, then the store's gross profit on the game after the price increase was what percent of the cost of the game?

- A. 10.5%
- B. 11%
- C. 12.5%
- D. 13%
- E. 15%

Answer:

Q22:

Four extra-large sandwiches of exactly the same size were ordered for m students, where $m > 4$. Three of the sandwiches were evenly divided among the students. Since 4 students did not want any of the fourth sandwich, it was evenly divided among the remaining students. If Carol ate one piece from each of the four sandwiches, the amount of sandwich that she ate would be what fraction of a whole extra-large sandwich?

- A. $\frac{m+4}{m(m-4)}$
- B. $\frac{2m-4}{m(m-4)}$
- C. $\frac{4m-4}{m(m-4)}$
- D. $\frac{4m-8}{m(m-4)}$
- E. $\frac{4m-12}{m(m-4)}$

Answer:

Q23:

When the wind speed is 9 miles per hour, the wind-chill factor w is given by $w = -17.366 + 1.19t$, where t is the temperature in degrees Fahrenheit. If at noon yesterday the wind speed was 9 miles per hour, was the wind-chill factor greater than 0?

- (1) The temperature at noon yesterday was greater than 10 degrees Fahrenheit.
- (2) The temperature at noon yesterday was less than 20 degrees Fahrenheit.

- 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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Answer:

Q24:

Which of the following is closest in value to $9^9 - 9^2$?

- A. 9^9
- B. 9^8
- C. 9^7
- D. 9^6
- E. 9^5

Answer:

Q25:

An office supply store received a shipment of boxes of pencils. How many pencils were in the shipment altogether? (1 gross = 12 dozen)

- (1) The number of boxes of pencils in the shipment was 6 gross.
- (2) There were 3 dozen pencils in each box of pencils in the shipment.

- 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.
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Answer:

Q26:

Of the following values of n , the value of $\left(-\frac{1}{5}\right)^{-n}$ will be greatest for $n =$

- A. 3
- B. 2
- C. 0
- D. -2
- E. -3

Answer:

Q27:

For all numbers x , the function f is defined by $f(x) = 3x + 1$ and the function g is defined by $g(x) = \frac{x-1}{3}$. If c is a positive number, what is the value of $g(c)$?

- (1) $f(c) = 13$
- (2) $f(1) = c$

- 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.
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Answer:

Q28:

A certain company expects quarterly earnings of \$0.80 per share of stock, half of which will be distributed as dividends to shareholders while the rest will be used for research and development. If earnings are greater than expected, shareholders will receive an additional \$0.04 per share for each additional \$0.10 of per share earnings. If quarterly earnings are \$1.10 per share, what will be the dividend paid to a person who owns 200 shares of the company's stock?

- A. \$92
- B. \$96
- C. \$104
- D. \$120
- E. \$240

Answer:

Q29:

For which real numbers x is the expression $\frac{2}{(x-2)(x+1)}$ not defined?

- A. $x = 0$ only
- B. $x = 2$ only
- C. $x = -1$ only
- D. $x = -1$ or 2
- E. $x = -1, 0$, or 2

Answer:

Q30:

What is the value of $(2x - 5)^3$?

- (1) $(2x)^3 = 216$
- (2) $(2x + 3)^2 = 81$

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Answer:

Q31:

Phobus, one of the satellites of Mars, revolves about Mars at a distance of approximately 5,800 miles from the center of Mars and approximately 3,700 miles from the surface of Mars. If it is assumed that Mars is spherical and the orbit of Phobus is circular, what is the approximate circumference, in miles, of Mars at its equator?

- A. $2,100\pi$
- B. $4,200\pi$
- C. $7,400\pi$
- D. $9,500\pi$
- E. $190,000\pi$

Answer:

Q32:

In the decimal representation of x , where $0 < x < 1$, is the tenths digit of x nonzero?

- (1) $16x$ is an integer.
- (2) $8x$ is an integer.

- 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.
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Answer:

Q33:

A small business invests \$9,900 in equipment to produce a product. Each unit of the product costs \$0.65 to produce and is sold for \$1.20. How many units of the product must be sold before the revenue received equals the total expense of production, including the initial investment in equipment?

- A. 12,000
- B. 14,500
- C. 15,230
- D. 18,000
- E. 20,000

Answer:

Q34:

A merchant discounted the sale price of a coat and the sale price of a sweater. Which of the two articles of clothing was discounted by the greater dollar amount?

- (1) The percent discount on the coat was 2 percentage points greater than the percent discount on the sweater.
- (2) Before the discounts, the sale price of the coat was \$10 less than the sale price of the sweater.

- 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.
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Answer:

Q35:

If $g(x) = x + 4$ for all x and $f(x) = \frac{2x^2 - 5}{x}$ for all nonzero x , then $f(x) = g(x)$ for which of the following values of x ?

- A. -5
- B. -3
- C. 1
- D. 3
- E. 5

Answer:

Q36:

Is $x > 5$?

- (1) $x^2 > 25$
- (2) $2x + 7 > 0$

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Answer:

Q37:

Pumping alone at their respective constant rates, one inlet pipe fills an empty tank to $\frac{1}{2}$ of capacity in 3 hours and a second inlet pipe fills the same empty tank to $\frac{2}{3}$ of capacity in 6 hours. How many hours will it take both pipes, pumping simultaneously at their respective constant rates, to fill the empty tank to capacity?

- A. 3.25
- B. 3.6
- C. 4.2
- D. 4.4
- E. 5.5

Answer:

Answers:

DEEBB, BDCCD, CEBDE, ACBDC, EEEAC, BDCDA, BBDEE, CB