1. Which of the following is an equation of a line that is perpendicular to $4x+2y=9$?

$y=2x-4$
$y=-2x+92$
$-4x+2y=9$
$y=-12x+9$
$y=12x+4$

2. The average (arithmetic mean) high temperature for *x* days is 70 degrees. The addition of one day with a high temperature of 75 degrees increases the average to 71 degrees.

Quantity A	**Quantity B**
x	5

(A) Quantity A is greater.
(B) Quantity B is greater.
(C) The two quantities are equal.
(D) The relationship cannot be determined from the information given.

3. *a* and *b* are integers.
$a^2 = b^3$

Quantity A	**Quantity B**
a	*b*

(A) Quantity A is greater.
(B) Quantity B is greater.
(C) The two quantities are equal.
(D) The relationship cannot be determined from the information given.

4. A certain pet store sells only dogs and cats. In March, the store sold twice as many dogs as cats. In April, the store sold twice the number of dogs that it sold in March, and three times the number of cats that it sold in March. If the total number of pets the store sold in March and April combined was 500, how many dogs did the store sell in March?

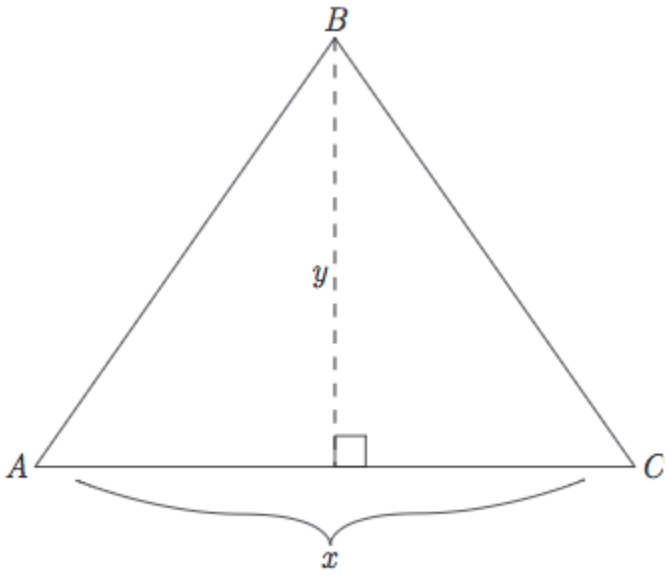
(A) 80
(B) 100
(C) 120
(D) 160
(E) 180

5. A magician marks-off on a stick of length 1 yard in thirds and fifths and breaks the stick at the marked points. What is the maximum number of pieces which are equal in length?

- 2
- 3

- 4
- 5
- 6

6. Ron will walk from intersection A to intersection B along a route that is confined to the square grid of three streets and four avenues shown in the map above. How many routes from A to B can Ron take that have a minimum possible leng



$\triangle ABC$ has an area of 108 cm ^{2}. If both x and y are integers, which of the following could be the value of x ?

Indicate all such values.

(A) 4
(B) 5
(C) 6
(D) 8
(E) 9

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6. A magician marks-off on a stick of length 1 yard in thirds and fifths and breaks the stick at the marked points. What is the maximum number of pieces which are equal in length?

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- 3
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- 6

7. Ron will walk from intersection A to intersection B along a route that is confined to the square grid of three streets and four avenues shown in the map above. How many routes from A to B can Ron take that have a minimum possible length?

8. Investment of $4000 at R% per annum compounded annually will become $16000 in 8 years. If $2000 is invested at R% per annum compounded annually, in how many years will the investment become $16000?

9. $xy>0$ $xy>0$

- **Quantity A**

  x^2y^4

- **Quantity B**

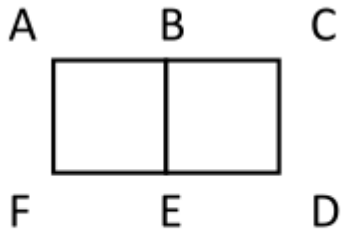
  x^3y^6

A Quantity A is greater.

B Quantity B is greater.

C The two quantities are equal.

D The relationship cannot be determined from the information given.



Note: Not drawn to scale

10.

In the figure shown above, line segment BC has length 16 cm, rectangle FABE is a square, and the area of rectangular region FACD is 612 cm^2.

- **Quantity A**

  Area of FABE

- **Quantity B**

  Area of EBCD

A Quantity A is greater.

B Quantity B is greater.

C The two quantities are equal.

D The relationship cannot be determined from the information given.

11. Working independently, Machine A can complete a work in 3.5 hours, while Machine B can complete the same work in x hours. Working simultaneously, they together complete the same work in 1.5 hours.

- **Quantity A**
  3
- **Quantity B**
  x

A Quantity A is greater.

B Quantity B is greater.

C The two quantities are equal.

D The relationship cannot be determined from the information given.

12. A driver completed the first 20 miles of a 40-mile trip at an average speed of 50 miles per hour and the second 20 miles at an average speed of x miles per hour. The average speed for the entire 40-mile trip was 60 miles per hour. (Assume that the driver did not make any stops during the 40-mile trip.)

- **Quantity A**
  $x-60$
- **Quantity B**
  10

A Quantity A is greater.

B Quantity B is greater.

C The two quantities are equal.

D The relationship cannot be determined from the information given.

13. A positive integer x is a perfect number if the sum of all the factors of x, including 1 and x, is equal to $2x$.

- **Quantity A**

The sum of the reciprocals of all the factors of the perfect number 28

- **Quantity B**
  2

A Quantity A is greater.

B Quantity B is greater.

C The two quantities are equal.

D The relationship cannot be determined from the information given.

14. The sequence $a_1, a_2, a_3, \ldots a_n, \ldots$ a1,a2,a3,…an,… is such that $a_1 = -2, a_2 = -5, a_3 = 4, a_4 = 3$, and $a_n = a_{n-4}$ for $n > 4$ a1=−2,a2=−5,a3=4,a4=3,and an=an−4 for n>4.

- **Quantity A**
  The sum of the first 64 terms of the sequence
- **Quantity B**
  The sum of the first 98 terms of the sequence

A Quantity A is greater.

B Quantity B is greater.

C The two quantities are equal.

D The relationship cannot be determined from the information given.

15. 3, a, 1, 9, b, 3 3,a,1,9,b,3

The arithmetic mean of the list of numbers above is 4 and a a and b b are integers.

- **Quantity A**
  Median of the list
- **Quantity B**
  Mean of the list

A Quantity A is greater.

B Quantity B is greater.

C The two quantities are equal.

D The relationship cannot be determined from the information given.

16. x is chosen at random from the set $\{1,2,3,4\}$ and y is chosen at random from the set $\{5,7,9\}$.

- **Quantity A**
  The probability that xy will be even
- **Quantity B**
  The probability that $(x+y)$ will be even

A Quantity A is greater.

B Quantity B is greater.

C The two quantities are equal.

D The relationship cannot be determined from the information given.

17. $4 < \frac{7-x}{3}$

- **Quantity A**
  Maximum value of $-(5-x)-(5-x)$
- **Quantity B**
  Maximum value of $2x$

A Quantity A is greater.

B Quantity B is greater.

C The two quantities are equal.

D The relationship cannot be determined from the information given.

18. $0>p>q>r$

- **Quantity A**
  p/q
- **Quantity B**

q/r

A Quantity A is greater.

B Quantity B is greater.

C The two quantities are equal.

D The relationship cannot be determined from the information given.

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19. If the roots of the equation $x^2-16x-612=0$ are aa and bb, what is the value of a+ba+b?

A -612

B -16

C 0

D 16

E 612

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20. If $\sqrt{x+6}+\sqrt{x+1}=5$, what is the value of x^2?

A 1

B 4

C 9

D 16

E 25