13

A right circular cone has a volume of $\frac{1}{3}\pi$ cubic feet and a height of 9 feet. What is the radius, in feet, of the base of the cone?

A) $\frac{1}{3}$

B) $\frac{1}{\sqrt{3}}$

C) $\sqrt{3}$

D) 3

14

Which of the following is equivalent to $r^{\frac{2}{5}}\cdot\sqrt{r}$, where r is greater than 0?

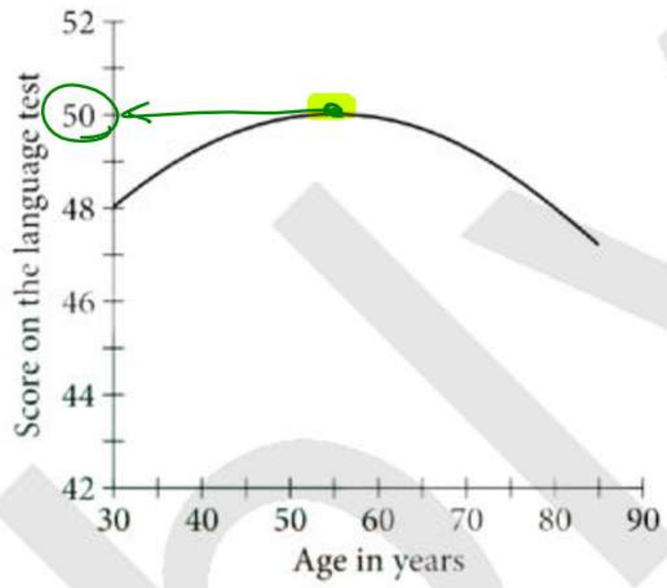
A) $r^{\frac{1}{5}}$

B) $r^{\frac{3}{10}}$

C) $r^{\frac{3}{7}}$

D) $r^{\frac{9}{10}}$

15



A scientist tested a group of adults aged 30 to 85. The graph shows the quadratic function S, which models their scores on a language test as a function of their age x, in years. Which of the following could define S

A) $S(x)=-\frac{1}{320}(x-50)^2+55$

B) $S(x)=-\frac{1}{320}(x-55)^2+50$

C) $S(x)=\frac{1}{320}(x-50)^2+55$

D) $S(x)=\frac{1}{320}(x-55)^2+50$

$S = \frac{d}{t}$ $60 = \frac{d}{1}$ $d = 60$

$d = 210 - 60 = 150$ $S = 50$ $S = \frac{d}{t}$ $\frac{50}{1} = \frac{150}{t}$ $\frac{150 \times 1}{50} = 3$

16

On a 210-mile trip, Cameron drove at an average speed of 60 miles per hour for the first x hours. He then completed the trip, driving at an average speed of 50 miles per hour for the remaining y hours. If x equals 1, what is the value of y ?

A) 1
B) 2
C) 3
D) 4

17

$$2zw^2 - 3w - 10 = 2z$$

In the equation above, what is the value of z when $w = 2$?

A) 8/4
B) 8/3
C) 4
D) 8

$2z(2)^2 - 3(2) - 10 = 2z$

$8z - 6 - 10 = 2z$

$8z - 2z = 6 + 10$

$6z = 16$

$z = \frac{16 \div 2}{6 \div 2} = \frac{8}{3}$

18

$$x - 2\sqrt{x} - 3 = 0$$

What value of x satisfies the equation above?

A) -9
B) -6
C) 6
D) 9

$9 - 2\sqrt{9} - 3$

$9 - 2(3) - 3$

$9 - 6 - 3 = 0$

19

$$x + y = 2$$
$$x - y = 3$$

If (x, y) is the solution to the system of equations above, what is the value of x?

A) 2.5
B) 4
C) 6.5
D) 12

20

$$2k(x-2) = x-2$$

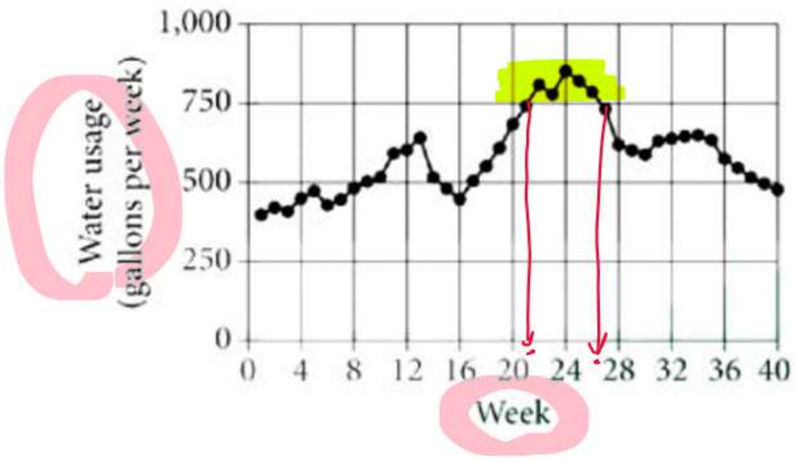
In the equation above, k is a constant. If the equation has infinitely many solutions, what is the value of k?

A) 1/4
B) 1/2
C) 1
D) 3/2

STOP

If you finish before time is called, you may check your work on this section only.
Do not turn to any other section.

1



The graph above shows the Chen family's water usage over 40 weeks. During which of the following periods was the family's water usage above 750 gallons per week?

A) From week 5 through week 8
B) From week 13 through week 17
C) From week 22 through week 26
D) From week 33 through week 36

2

The distance between two locations on a map is 6 centimeters (cm). If 1 cm on the map corresponds to an actual distance of 15 miles, what is the actual distance, in miles, between the two locations?

A) 0.4
B) 2.5
C) 90
D) 150

3

A store received a shipment of 1,000 MP3 players, 4 of which were defective. If an MP3 player is randomly selected from this shipment, what is the probability that it is defective?

A) 0.004
B) 0.04
C) 0.4
D) 4

4

$$f(x)=(x+0.25x)\,(50-x)$$

The function f is defined above. What is the value of $f(20)$?

A) 250
B) 500
C) 750
D) 2000

5

Which of the following expressions is equivalent to $2(ab - 3) + 2$

$2ab - 6 + 2$

$2ab - 4$

A) $2ab - 1$
B) $2ab - 4$
C) $2ab - 5$
D) $2ab - 8$

6

What number is 20% greater than 60 ?

$1.20 \times 60 = 72$

A) 50
B) 72
C) 75
D) 132

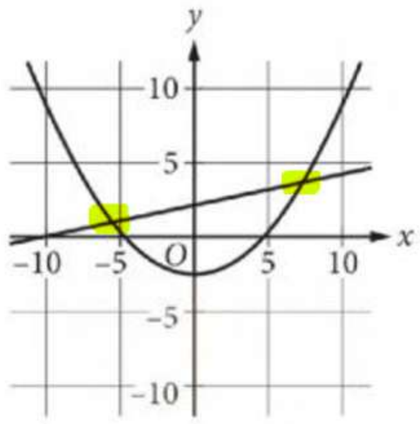
7

The graph of $y = 3x - 5$ in the xy-plane is a line. What is the slope of the line?

$y = mx + b$

A) -5
B) 2
C) 3
D) 5

8



A system of equations consists of a quadratic equation and a linear equation. The equations in this system are graphed in the xy-plane above. How many solutions does this system have?

A) 0
B) 1
C) 2
D) 3

9

$2n + 6 = 14$

A tree had a height of 6 feet when it was planted. The equation above can be used to find how many years n it took the tree to reach a height of 14 feet. Which of the following is the best interpretation of the number 2 in this context?

A) The number of years it took the tree to double its height
B) The average number of feet that the tree grew per year
C) The height, in feet, of the tree when the tree was 1 year old
D) The average number of years it takes similar trees to grow 14 feet

10

Residents of a town were surveyed to determine whether they are satisfied with the concession stand at the local park. A random sample of 200 residents was selected. All 200 responded, and 87% said they are satisfied. Based on this information, which of the following statements must be true?

I. Of all the town residents, 87% would say they are satisfied with the concession stand at the local park.

II. If another random sample of 200 residents were surveyed, 87% would say they are satisfied.

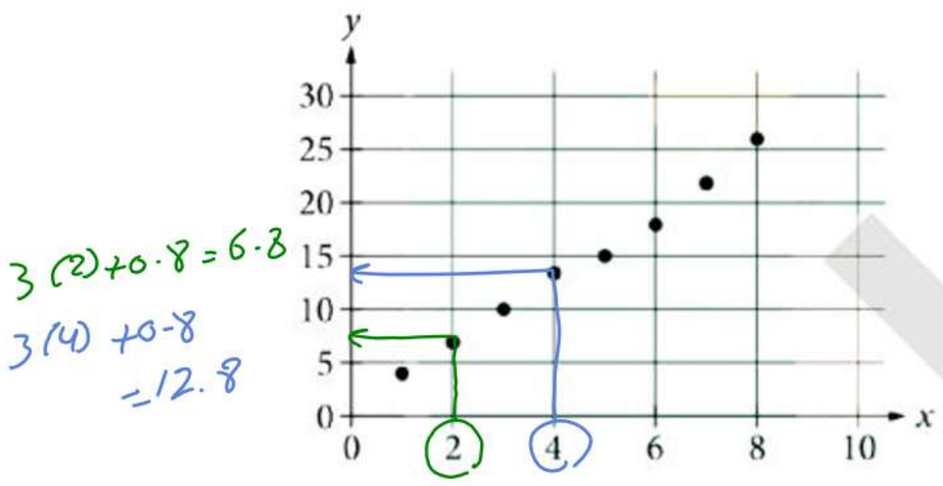
A) Neither
B) I only
C) II only
D) I and II

11

In the xy-plane, the graph of $y = x + 3$ intersects the graph of $y = 2x - 6$ at the point with coordinates (a,b). What is the value of a?

A) 3
B) 6
C) 9
D) 12

12



Which of the following could be the equation for a line of best fit for the data shown in the scatterplot above?

A) $y = 3x + 0.8$
B) $y = 0.8x + 3$
C) $y = -0.8x + 3$
D) $y = -3x + 0.8$

13

$$(8 - \sqrt{x})^2 = (4 + \sqrt{x})^2$$

What is the solution to the equation above?

A) $x = 2$
B) $x = 4$
C) $x = 8$
D) $x = 16$

14

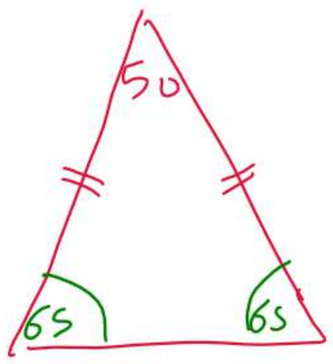
A fish hatchery has three tanks for holding fish before they are introduced into the wild. Ten fish weighing less than 5 ounces are placed in tank A. Eleven fish weighing at least 5 ounces but no more than 13 ounces are placed in tank B. Twelve fish weighing more than 13 ounces are placed in tank C. Which of the following could be the median of the weights, in ounces, of these 33 fish?

A) 4.5
B) 8
C) 13.5
D) 15

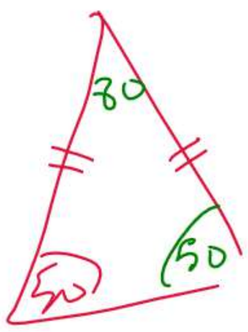
15

In triangle ABC, the measure of $\angle A$ is 50 °. If triangle ABC is isosceles, which of the following is NOT a possible measure of $\angle B$?

A) 50°
B) 65°
C) 80°
D) 100°



$\frac{180-50}{2} = 65$



$180-(50+50)$
$= 80$

16

In the *xy*-plane, a circle with radius 5 has center with coordinates (- 8 , 6). Which of the following is an equation of the circle?

A) $(x - 8)^2 + (y + 6)^2 = 25$
B) $(x + 8)^2 + (y - 6)^2 = 25$
C) $(x - 8)^2 + (y + 6)^2 = 5$
D) $(x + 8)^2 + (y - 6)^2 = 5$

$= 5^2$

$= 25$

Circles

$(x-h)^2 + (y-k)^2 = r^2$
Center (h, k)
radius $= \sqrt{r^2}$

$(x-2)^2 + (y+5)^2 = 16$
$C(2, -5)$
radius $= \sqrt{16} = 4$

$x^2 + ax + y^2 + by = c$
$C\left(\frac{a}{-2}, \frac{b}{-2}\right)$
$r = \sqrt{\left(\frac{a}{-2}\right)^2 + \left(\frac{b}{-2}\right)^2 + c}$

$x^2 - 4x + y^2 + 8y = 10$
$C\left(\frac{-4}{-2}, \frac{8}{-2}\right)$
$r = \sqrt{\left(\frac{-4}{-2}\right)^2 + \left(\frac{8}{-2}\right)^2 + 10}$

Questions 17 and 18 refer to the following information.

Climate Preferences

By TestDaily	Warm	Cool	No preference	Total
18–35 years old	295	168	45	508
36–50 years old	246	123	41	410
51–65 years old	238	117	48	403
Greater than 65	137	78	64	279
Total	916	486	198	1600

According to the 2010 Census, the adult population aged 18 years or greater of the United States in 2010 was 234,564,071. In 2010, a survey was conducted among a randomly chosen sample of adults aged 18 years or greater in the United States about their preference to live in a warm climate or a cool climate. The table below displays a summary of the survey results.

17

Based on the data, which of the following is closest to the probability that a randomly selected adult who is 18–35 years old prefers to live in a cool climate?

A) 0.11
B) 0.30
C) 0.33
D) 0.49

Prob. = Part / Total = 168/508 = 0.33

18

Which of the following is closest to the difference between the percentage of adults aged 18–50 years who responded "warm" and the percentage of adults aged 51 years or greater who responded "warm"?

A) 4%
B) 5%
C) 10%
D) 18%

(295+246)/(508+410) x 100

(238+137)/(403+279) x 100