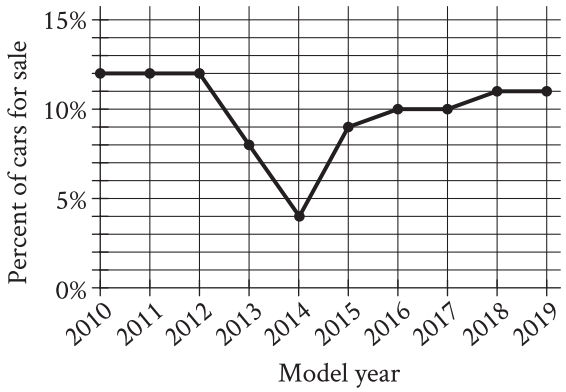
1

The line graph shows the percent of cars for sale at a used car lot on a given day by model year.



For what model year is the percent of cars for sale the smallest?

A) 2012

B) 2013

C) 2014

D) 2015

2

For a particular machine that produces beads, 29 out of every 100 beads it produces have a defect. A bead produced by the machine will be selected at random. What is the probability of selecting a bead that has a defect?

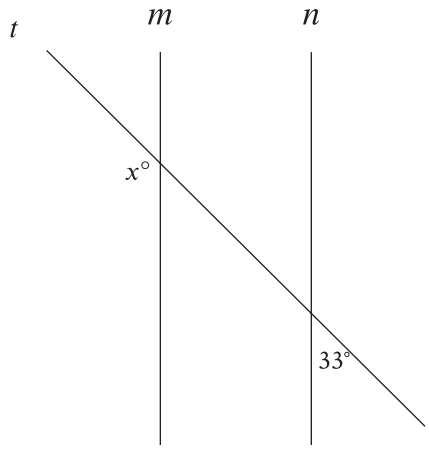
A) $\frac{1}{2{,}900}$

B) $\frac{1}{29}$

C) $\frac{29}{100}$

D) $\frac{29}{10}$

3



Note: Figure not drawn to scale.

In the figure, line m is parallel to line n, and line t intersects both lines. What is the value of x ?

A) 33

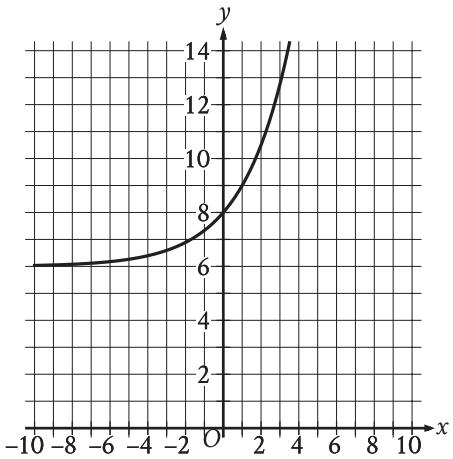
B) 57

C) 123

D) 147

CONTINUE

4



What is the y-intercept of the graph shown?

A) $(-8, 0)$

B) $(-6, 0)$

C) $(0, 6)$

D) $(0, 8)$

5

The total cost $f(x)$, in dollars, to lease a car for 36 months from a particular car dealership is given by $f(x) = 36x + 1{,}000$, where x is the monthly payment, in dollars. What is the total cost to lease a car when the monthly payment is $400?

A) $13,400

B) $13,000

C) $15,400

D) $37,400

6

Each side of a square has a length of 45. What is the perimeter of this square?

7

$$\frac{55}{x + 6} = x$$

What is the positive solution to the given equation?

8

An object travels at a constant speed of 12 centimeters per second. At this speed, what is the time, in seconds, that it would take for the object to travel 108 centimeters?

A) 9

B) 96

C) 120

D) 972

CONTINUE

9

Data set X: 5, 9, 9, 13
Data set Y: 5, 9, 9, 13, 27

The lists give the values in data sets X and Y. Which statement correctly compares the mean of data set X and the mean of data set Y?

A) The mean of data set X is greater than the mean of data set Y.
B) The mean of data set X is less than the mean of data set Y.
C) The means of data set X and data set Y are equal.
D) There is not enough information to compare the means.

10

A rocket contained 467,000 kilograms (kg) of propellant before launch. Exactly 21 seconds after launch, 362,105 kg of this propellant remained. On average, approximately how much propellant, in kg, did the rocket burn each second after launch?

A) 4,995
B) 17,243
C) 39,481
D) 104,895

11

If $4x + 2 = 12$, what is the value of $16x + 8$?

A) 40
B) 48
C) 56
D) 60

12

An object is kicked from a platform. The equation $h = -4.9t^2 + 7t + 9$ represents this situation, where h is the height of the object above the ground, in meters, t seconds after it is kicked. Which number represents the height, in meters, from which the object was kicked?

A) 0
B) 4.9
C) 7
D) 9

13

$$f(x) = 4x^2 - 50x + 126$$

The given equation defines the function f. For what value of x does $f(x)$ reach its minimum?

14

A small business owner budgets $2,200 to purchase candles. The owner must purchase a minimum of 200 candles to maintain the discounted pricing. If the owner pays $4.90 per candle to purchase small candles and $11.60 per candle to purchase large candles, what is the maximum number of large candles the owner can purchase to stay within the budget and maintain the discounted pricing?

CONTINUE

15

In the linear function f, $f(0) = 8$ and $f(1) = 12$. Which equation defines f ?

A) $f(x) = 12x + 8$

B) $f(x) = 4x$

C) $f(x) = 4x + 12$

D) $f(x) = 4x + 8$

16

The function $f(w) = 6w^2$ gives the area of a rectangle, in square feet (ft^2), if its width is w ft and its length is 6 times its width. Which of the following is the best interpretation of $f(14) = 1{,}176$?

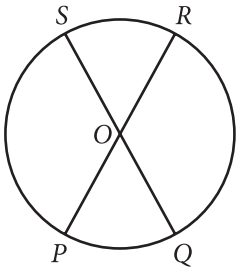
A) If the width of the rectangle is 14 ft, then the area of the rectangle is 1,176 ft^2.

B) If the width of the rectangle is 14 ft, then the length of the rectangle is 1,176 ft.

C) If the width of the rectangle is 1,176 ft, then the length of the rectangle is 14 ft.

D) If the width of the rectangle is 1,176 ft, then the area of the rectangle is 14 ft^2.

17



Note: Figure not drawn to scale.

The circle shown has center O, circumference 144π, and diameters $\overline{PR}$ and $\overline{QS}$. The length of arc PS is twice the length of arc PQ. What is the length of arc QR ?

A) 24π

B) 48π

C) 72π

D) 96π

18

A company that provides whale-watching tours takes groups of 21 people at a time. The company's revenue is 80 dollars per adult and 60 dollars per child. If the company's revenue for one group consisting of adults and children was 1,440 dollars, how many people in the group were children?

A) 3

B) 9

C) 12

D) 18

CONTINUE

19

The function h is defined by $h(x) = 4x + 28$. The graph of $y = h(x)$ in the xy-plane has an x-intercept at $(a, 0)$ and a y-intercept at $(0, b)$, where a and b are constants. What is the value of $a + b$?

A) 21
B) 28
C) 32
D) 35

20

One of the factors of $2x^3 + 42x^2 + 208x$ is $x + b$, where b is a positive constant. What is the smallest possible value of b ?

21

$$y = -1.5$$
$$y = x^2 + 8x + a$$

In the given system of equations, a is a positive constant. The system has exactly one distinct real solution. What is the value of a ?

22

$$f(x) = (x + 6)(x + 5)(x - 4)$$

The function f is given. Which table of values represents $y = f(x) - 3$?

A)

x	y
−6	−9
−5	−8
4	1

B)

x	y
−6	−3
−5	−3
4	−3

C)

x	y
−6	−3
−5	−2
4	7

D)

x	y
−6	3
−5	3
4	3

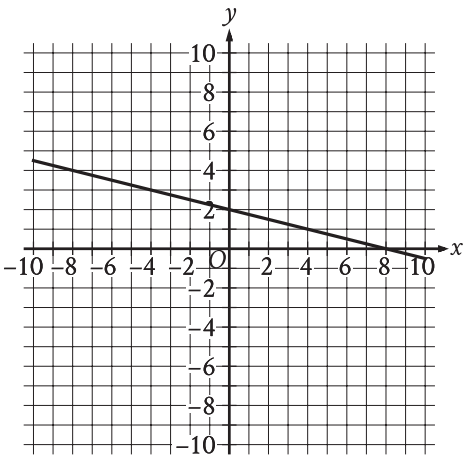
23

For the function q, the value of $q(x)$ decreases by 45% for every increase in the value of x by 1. If $q(0) = 14$, which equation defines q ?

A) $q(x) = 0.55(14)^x$
B) $q(x) = 1.45(14)^x$
C) $q(x) = 14(0.55)^x$
D) $q(x) = 14(1.45)^x$

CONTINUE

24



The graph of $y = f(x) + 14$ is shown. Which equation defines function f?

A) $f(x) = -\frac{1}{4}x - 12$

B) $f(x) = -\frac{1}{4}x + 16$

C) $f(x) = -\frac{1}{4}x + 2$

D) $f(x) = -\frac{1}{4}x - 14$

25

$RS = 20$
$ST = 48$
$TR = 52$

The side lengths of right triangle RST are given. Triangle RST is similar to triangle UVW, where S corresponds to V and T corresponds to W. What is the value of $\tan W$?

A) $\frac{5}{13}$

B) $\frac{5}{12}$

C) $\frac{12}{13}$

D) $\frac{12}{5}$

CONTINUE