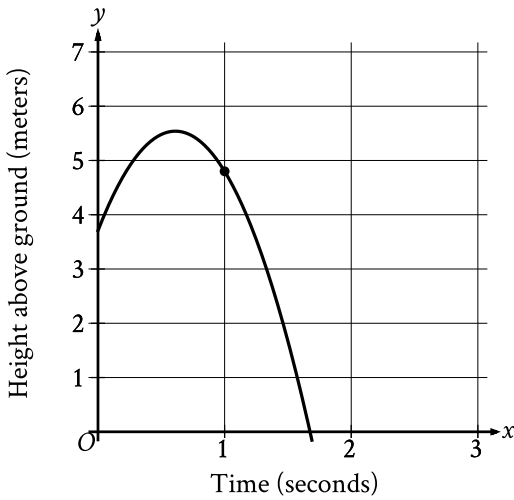


#1

ID: 4fbffc0a



The graph shows the height above ground, in meters, of a ball  $x$  seconds after the ball was launched upward from a platform. Which statement is the best interpretation of the marked point  $(1.0, 4.8)$  in this context?

- A) 1.0 second after being launched, the ball's height above ground is 4.8 meters.
- B) 4.8 seconds after being launched, the ball's height above ground is 1.0 meter.
- C) The ball was launched from an initial height of 1.0 meter with an initial velocity of 4.8 meters per second.
- D) The ball was launched from an initial height of 4.8 meters with an initial velocity of 1.0 meter per second.

#2

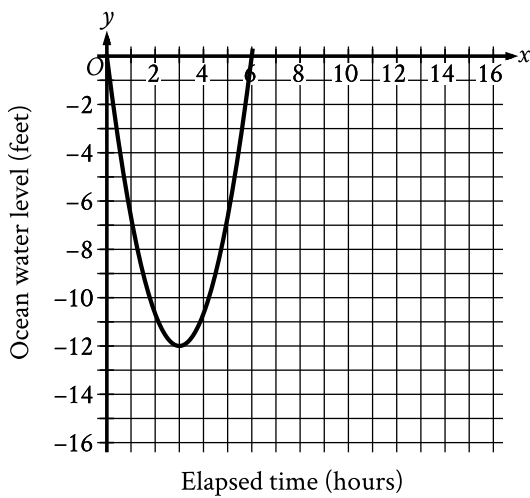
ID: 6abec9a8

What is the  $y$ -intercept of the graph shown?

- A)  $(-1, -9)$
- B)  $(0, -5)$
- C)  $(0, -4)$
- D)  $(0, 0)$

#3

ID: 1ee962ec



Scientists recorded data about the ocean water levels at a certain location over a period of 6 hours. The graph shown models the data, where  $y = 0$  represents sea level. Which table gives values of  $x$  and their corresponding values of  $y$  based on the model?

A)

$x$	$y$
0	-12
0	3
3	6

B)

$x$	$y$
0	0
3	12
0	-6

C)

$x$	$y$
0	0
3	-12
6	0

D)

$x$	$y$
0	0
12	3
-6	0

#4

ID: 07bcecac

$$P(t) = 24.8(1.036)^t$$

The function  $P$  gives the predicted population, in millions, of a certain country for the period from 1984 to 2018, where  $t$  is the number of years after 1984. According to the model, what is the best interpretation of the statement “ $P(8)$  is approximately equal to 32.91”?

- A) In 1984, the predicted population of this country was approximately 8 million.
- B) In 1984, the predicted population of this country was approximately 32.91 million.
- C) 8 years after 1984, the predicted population of this country was approximately 32.91 million.
- D) 32.91 years after 1984, the predicted population of this country was approximately 8 million.

#5

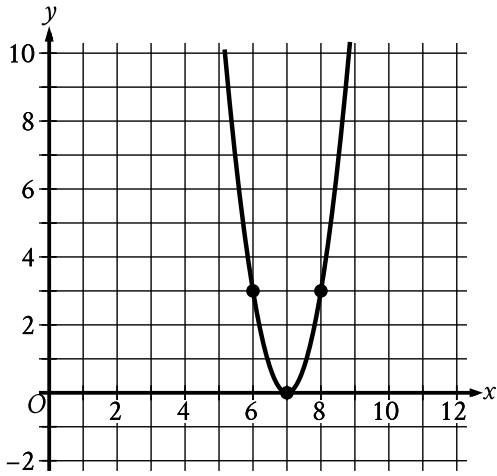
ID: 788bfd56

The function  $f$  is defined by  $f(x) = 4 + \sqrt{x}$ . What is the value of  $f(144)$ ?

- A) 0
- B) 16
- C) 40
- D) 76

#6

ID: cc2601cb



The x-intercept of the graph shown is  $(x, 0)$ .  
What is the value of  $x$ ?

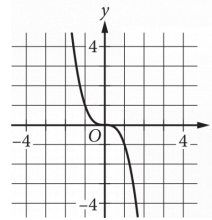
#7

ID: b39d74a0

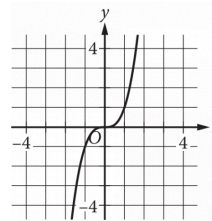
$xy$   
00  
11  
28  
327

The table shown includes some values of  $x$  and their corresponding values of  $y$ . Which of the following graphs in the  $xy$ -plane could represent the relationship between  $x$  and  $y$ ?

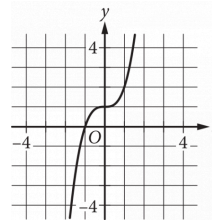
A)



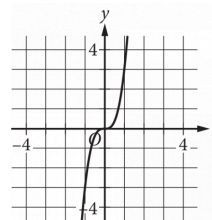
B)



C)



D)



#8

ID: 837e9da7

The function  $f$  is defined by  $f(x) = \frac{1}{6x}$ . What is the value of  $f(x)$  when  $x = 3$ ?

- A)  $\frac{1}{3}$
- B)  $\frac{1}{6}$
- C)  $\frac{1}{9}$
- D)  $\frac{1}{18}$

#9

ID: b5c43226

What is the  $y$ -intercept of the graph shown?

- A) (0,0)
- B) (0,2)
- C) (2,0)
- D) (2,2)

#10

ID: 2fec8bf4

$$P(t) = 1,800(1.02)^t$$

The function  $P$  gives the estimated number of marine mammals in a certain area, where  $t$  is the number of years since a study began. What is the best interpretation of  $P(0) = 1,800$  in this context?

- A) The estimated number of marine mammals in the area was 102 when the study began.
- B) The estimated number of marine mammals in the area was 1,800 when the study began.
- C) The estimated number of marine mammals in the area increased by 102 each year during the study.
- D) The estimated number of marine mammals in the area increased by 1,800 each year during the study.

#11

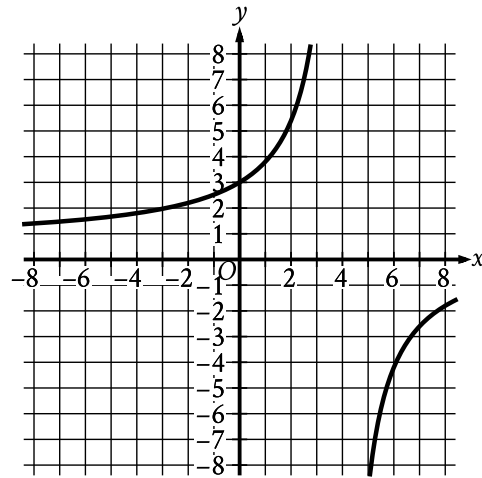
ID: e166aca6

What is the  $x$ -intercept of the graph shown?

- A)  $(-5, 0)$
- B)  $(5, 0)$
- C)  $(-4, 0)$
- D)  $(4, 0)$

#12

ID: ad376f1a



The graph of  $y = f(x)$  is shown in the  $xy$ -plane. What is the value of  $f(0)$ ?

- A)  $-3$
- B)  $0$
- C)  $\frac{3}{5}$
- D)  $3$

#13

ID: bd4d0e0c

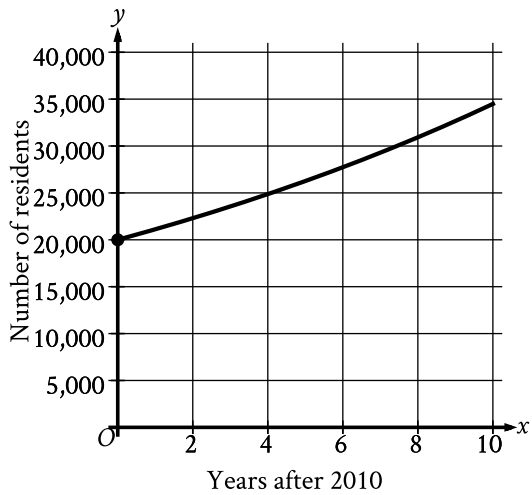
The function  $f$  is defined by

$f(x) = 10x^2 - 32x - 152$ . What is the value of  $f(0)$ ?

- A)  $-152$
- B)  $-32$
- C)  $0$
- D)  $10$

#14

ID: 2d394c28

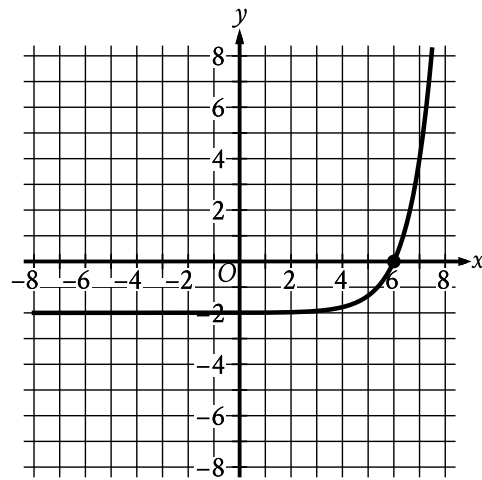


The graph shown models the number of residents of a certain city  $x$  years after 2010. How many residents does this model estimate the city had in 2010?

- A) 0
- B) 2,000
- C) 20,000
- D) 25,000

#15

ID: 2b6c12eb



What is the  $x$ -coordinate of the  $x$ -intercept of the graph shown?

#16

ID: 79e6ec70

What is the x-intercept of the graph shown?

- A) (-5,0)
- B) (5,0)
- C) (-2,0)
- D) (2,0)

#17

ID: 5377d9cf

If  $f(x) = \frac{x^2 - 6x + 3}{x - 1}$ , what is  $f^{-1}$ ?

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

#18

ID: 75915e3c

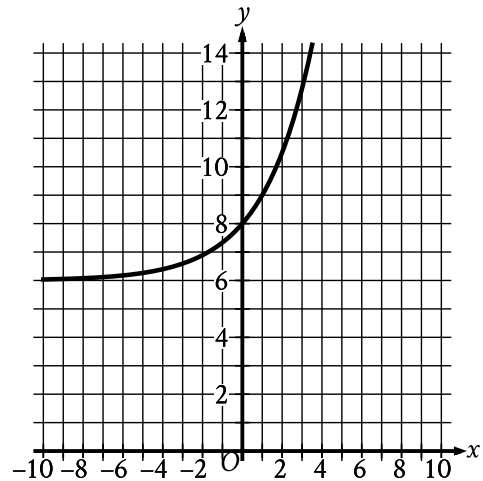
$$f(x) = 2(3^x)$$

For the function  $f$  defined above, what is the value of  $f(2)$ ?

- A) 9
- B) 12
- C) 18
- D) 36

#19

ID: f547a8b1

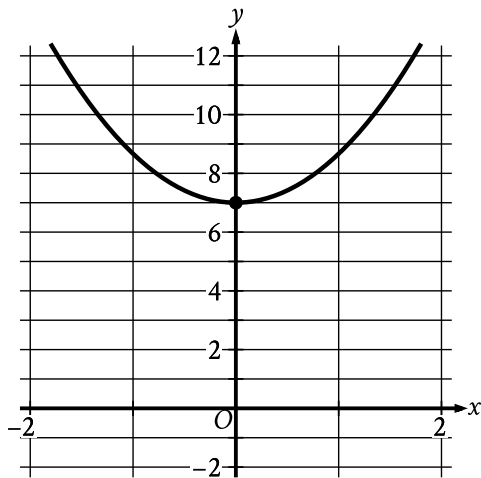


What is the y-intercept of the graph shown?

- A) (-8,0)
- B) (-6,0)
- C) (0,6)
- D) (0,8)

#20

ID: 2f4eafcc



The parabola shown intersects the  $y$ -axis at the point  $(x, y)$ . What is the value of  $y$ ?

#21

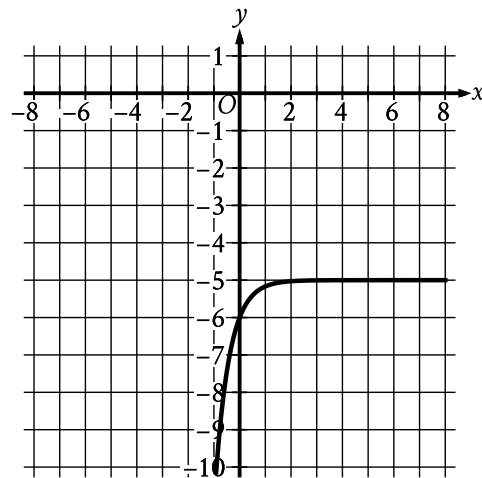
ID: 9da41c80

A ball is dropped from an initial height of 22 feet and bounces off the ground repeatedly. The function  $h$  estimates that the maximum height reached after each time the ball hits the ground is 85% of the maximum height reached after the previous time the ball hit the ground. Which equation defines  $h$ , where  $h(n)$  is the estimated maximum height of the ball after it has hit the ground  $n$  times and  $n$  is a whole number greater than 1 and less than 10?

- A)  $h(n) = 22(0.22)^n$
- B)  $h(n) = 22(0.85)^n$
- C)  $h(n) = 85(0.22)^n$
- D)  $h(n) = 85(0.85)^n$

#22

ID: 7160cbb3



What is the  $y$ -intercept of the graph shown?

- A)  $(0, -6)$
- B)  $(-6, 0)$
- C)  $(0, 0)$
- D)  $(-5, -5)$

#23

ID: 20722644

The function  $f$  is defined by  $f(x) = x^3 + 9$ . What is the value of  $f(2)$ ?

- A) 14
- B) 15
- C) 17
- D) 18



#24

ID: 94ff3e2d

The function  $h$  is defined by  $h(x) = \frac{8}{5x+6}$ . What is the value of  $h(2)$ ?

#26

ID: 09f58996

The function  $f$  is defined by  $f(x) = 6 + \sqrt{x}$ . What is the value of  $f(36)$ ?

#25

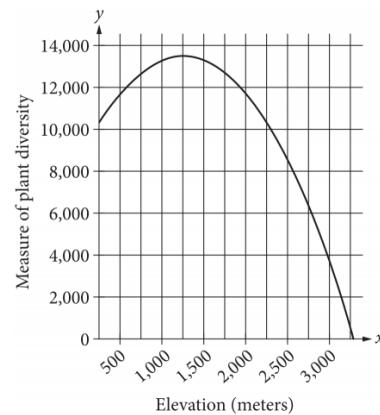
ID: 72ae8a87

The function  $f(x) = 200,000(1.21)^x$  gives a company's predicted annual revenue, in dollars,  $x$  years after the company started selling light bulbs online, where  $0 < x \leq 10$ . What is the best interpretation of the statement " $f(5)$  is approximately equal to 518,748" in this context?

- A) 5 years after the company started selling light bulbs online, its predicted annual revenue is approximately 518,748 dollars.
- B) 5 years after the company started selling light bulbs online, its predicted annual revenue will have increased by a total of approximately 518,748 dollars.
- C) When the company's predicted annual revenue is approximately 518,748 dollars, it is 5 times the predicted annual revenue for the previous year.
- D) When the company's predicted annual revenue is approximately 518,748 dollars, it is 5% greater than the predicted annual revenue for the previous year.

#27

ID: ebe4bde0

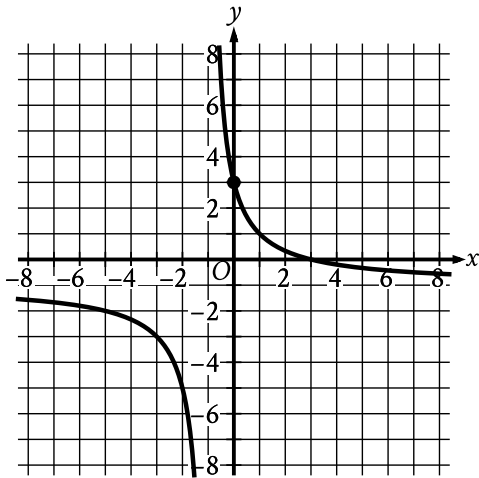


The quadratic function graphed above models a particular measure of plant diversity as a function of the elevation in a region of Switzerland. According to the model, which of the following is closest to the elevation, in meters, at which plant diversity is greatest?

- A) 13,500
- B) 3,000
- C) 1,250
- D) 250

#28

ID: c99d154a



What is the  $y$ -coordinate of the  $y$ -intercept of the graph shown?

#29

ID: 3ea87153

The function  $g$  is defined by  $g(x) = x^2 + 9$ . For which value of  $x$  is  $g(x) = 25$ ?

- A) 4
- B) 5
- C) 9
- D) 13

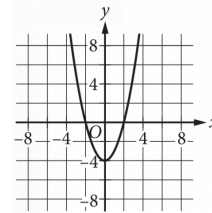
#30

ID: d46da42c

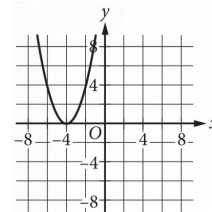
$$f(x) = x^2 + 4$$

The function  $f$  is defined as shown. Which of the following graphs in the  $xy$ -plane could be the graph of  $y = f(x)$  ?

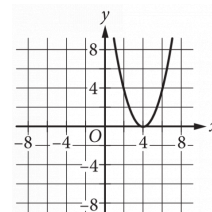
A)



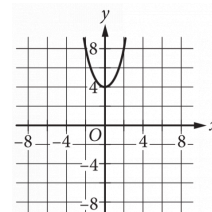
B)



C)



D)



#31

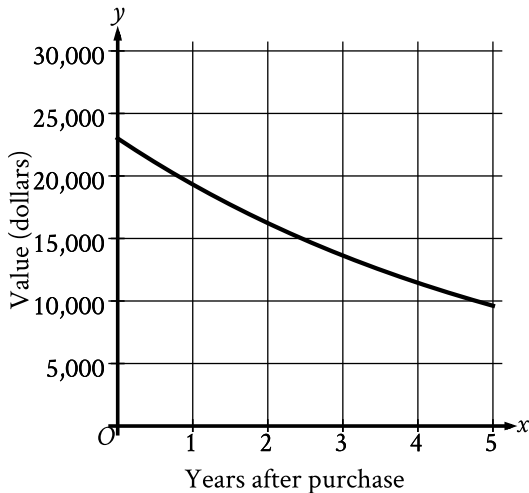
ID: 1863e3be

The  $y$ -intercept of the graph of  $y = x^2 + 31$  in the  $xy$ -plane is  $(0, y)$ . What is the value of  $y$ ?

#32

ID: ca4ee54e

The graph shows the predicted value  $y$ , in dollars, of a certain sport utility vehicle  $x$  years after it is first purchased.



Which of the following is closest to the predicted value of the sport utility vehicle 3 years after it is first purchased?

- A) \$ 9,619
- B) \$ 13,632
- C) \$ 19,320
- D) \$ 23,000

#33

ID: c1eead73

The function  $g$  is defined by  $g(x) = |x + 18|$ . What is the value of  $g(4)$ ?

- A) -18
- B) -4
- C) 14
- D) 22

#34

ID: 04b985e6

The kinetic energy, in joules, of an object with mass 9 kilograms traveling at a speed of  $v$  meters per second is given by the function  $K$ , where  $K(v) = \frac{9}{2}v^2$ . Which of the following is the best interpretation of  $K(34) = 5,202$  in this context?

- A) The object traveling at 34 meters per second has a kinetic energy of 5,202 joules.
- B) The object traveling at 340 meters per second has a kinetic energy of 5,202 joules.
- C) The object traveling at 5,202 meters per second has a kinetic energy of 34 joules.
- D) The object traveling at 23,409 meters per second has a kinetic energy of 34 joules.

#35

ID: 2cf7f039

The function  $f$  is defined by  $f(x) = 8\sqrt{x}$ . For what value of  $x$  does  $f(x) = 48$ ?

- A) 6
- B) 8
- C) 36
- D) 64

#36

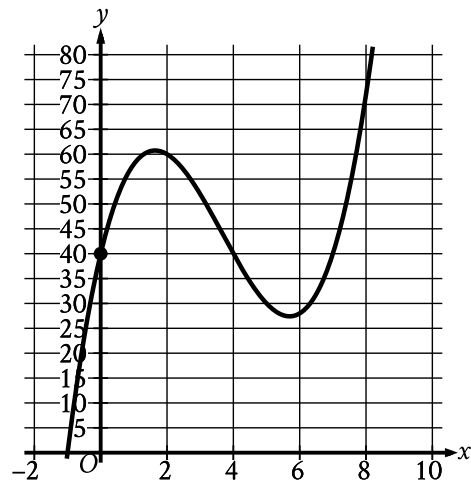
ID: 79ba511a

The function  $f$  is defined by  $f(x) = x^3 + 15$ . What is the value of  $f(2)$ ?

- A) 20
- B) 21
- C) 23
- D) 24

#37

ID: 26f5269a



The  $y$ -intercept of the graph shown is  $(x, y)$ . What is the value of  $y$ ?

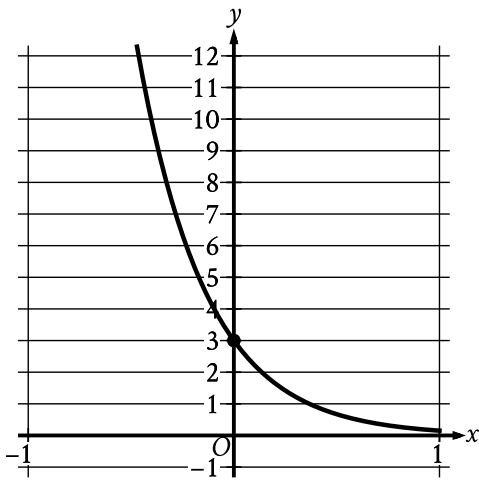
#38

ID: 50418728

The graph of the polynomial function  $f$ , where  $y = f(x)$ , is shown. The  $y$ -intercept of the graph is  $(0, y)$ . What is the value of  $y$ ?

#39

ID: 02c67921



The graph of the exponential function  $f$  is shown, where  $y = f(x)$ . The  $y$ -intercept of the graph is  $(0, y)$ . What is the value of  $y$ ?

#40

ID: de362c2f

The function  $f$  is defined by  $f(x) = 5x^2$ . What is the value of  $f(8)$ ?

- A) 40
- B) 50
- C) 80
- D) 320

#41

ID: 044c1cb7

$$h(x) = x^2 - 3$$

Which table gives three values of  $x$  and their corresponding values of  $h(x)$  for the given function  $h$ ?

A) 

$x$	1	2	3
$h(x)$	4	5	6

B) 

$x$	1	2	3
$h(x)$	-2	1	6

C) 

$x$	1	2	3
$h(x)$	-1	1	3

D) 

$x$	1	2	3
$h(x)$	-2	1	3

#42

ID: 39652e93

The function  $f$  is defined by  $f(x) = \frac{16}{x}$ . What is the value of  $f(x)$  when  $x = 17$ ?

- A)  $\frac{16}{17}$
- B)  $\frac{17}{16}$
- C) 16
- D) 17

#43

ID: ee05c84e

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

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

- A) 250
- B) 500
- C) 750
- D) 2,000