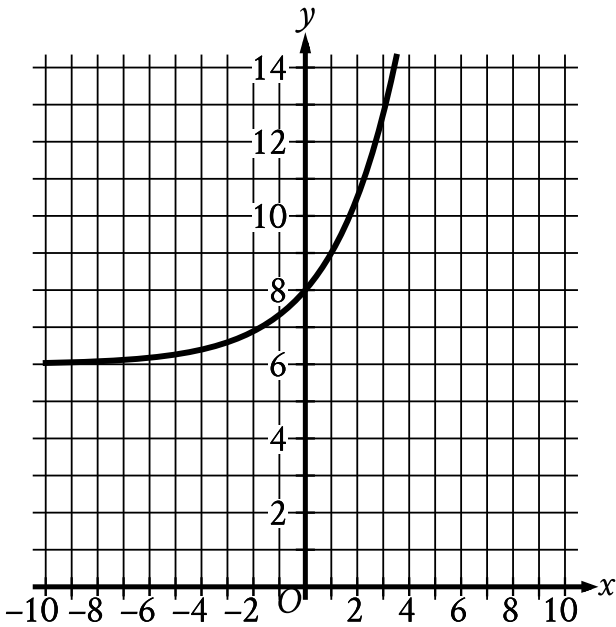


Question ID 5837cfab

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: 5837cfab



What is the y -intercept of the graph shown?

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

Question ID 54531d6a

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: 54531d6a

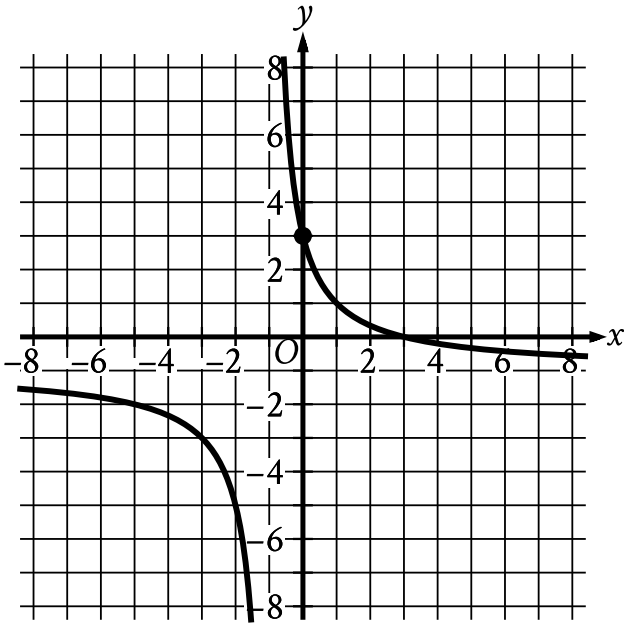
An investment account was opened with an initial value of **\$890**. The value of the account doubled every **10** years. Which equation represents the value of the account $M(t)$, in dollars, t years after the account was opened?

- A. $M(t) = 890\left(\frac{1}{2}\right)^{\frac{t}{10}}$
- B. $M(t) = 890\left(\frac{1}{10}\right)^{\frac{t}{2}}$
- C. $M(t) = 890(2)^{\frac{t}{10}}$
- D. $M(t) = 890(10)^{\frac{t}{2}}$

Question ID f839db39

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: f839db39

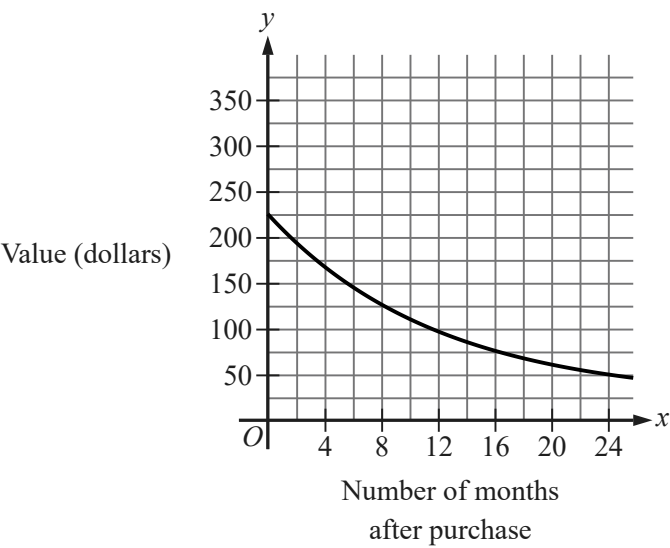


What is the y-coordinate of the y-intercept of the graph shown?

Question ID bdd8a2fe

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: bdd8a2fe



The graph shown gives the estimated value, in dollars, of a tablet as a function of the number of months since it was purchased. What is the best interpretation of the y -intercept of the graph in this context?

- A. The estimated value of the tablet was **\$225** when it was purchased.
- B. The estimated value of the tablet **24** months after it was purchased was **\$225**.
- C. The estimated value of the tablet had decreased by **\$225** in the **24** months after it was purchased.
- D. The estimated value of the tablet decreased by approximately **2.25%** each year after it was purchased.

Question ID 007febea

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: 007febea

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

Question ID f3a5805c

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: f3a5805c

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

Question ID 7f73ba98

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: 7f73ba98

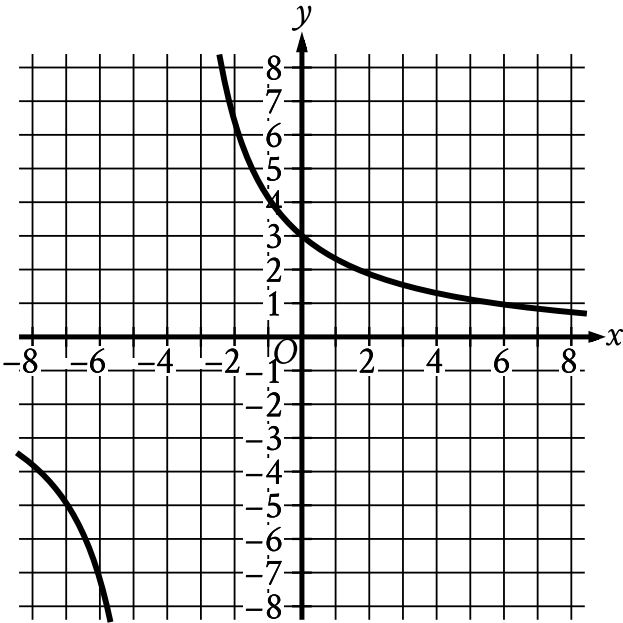
The function g is defined by $g(x) = \sqrt{8x + 1}$. What is the value of $g(3)$?

- A. $\frac{5}{8}$
- B. $\frac{25}{8}$
- C. 5
- D. 25

Question ID 9af7b53c

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: 9af7b53c

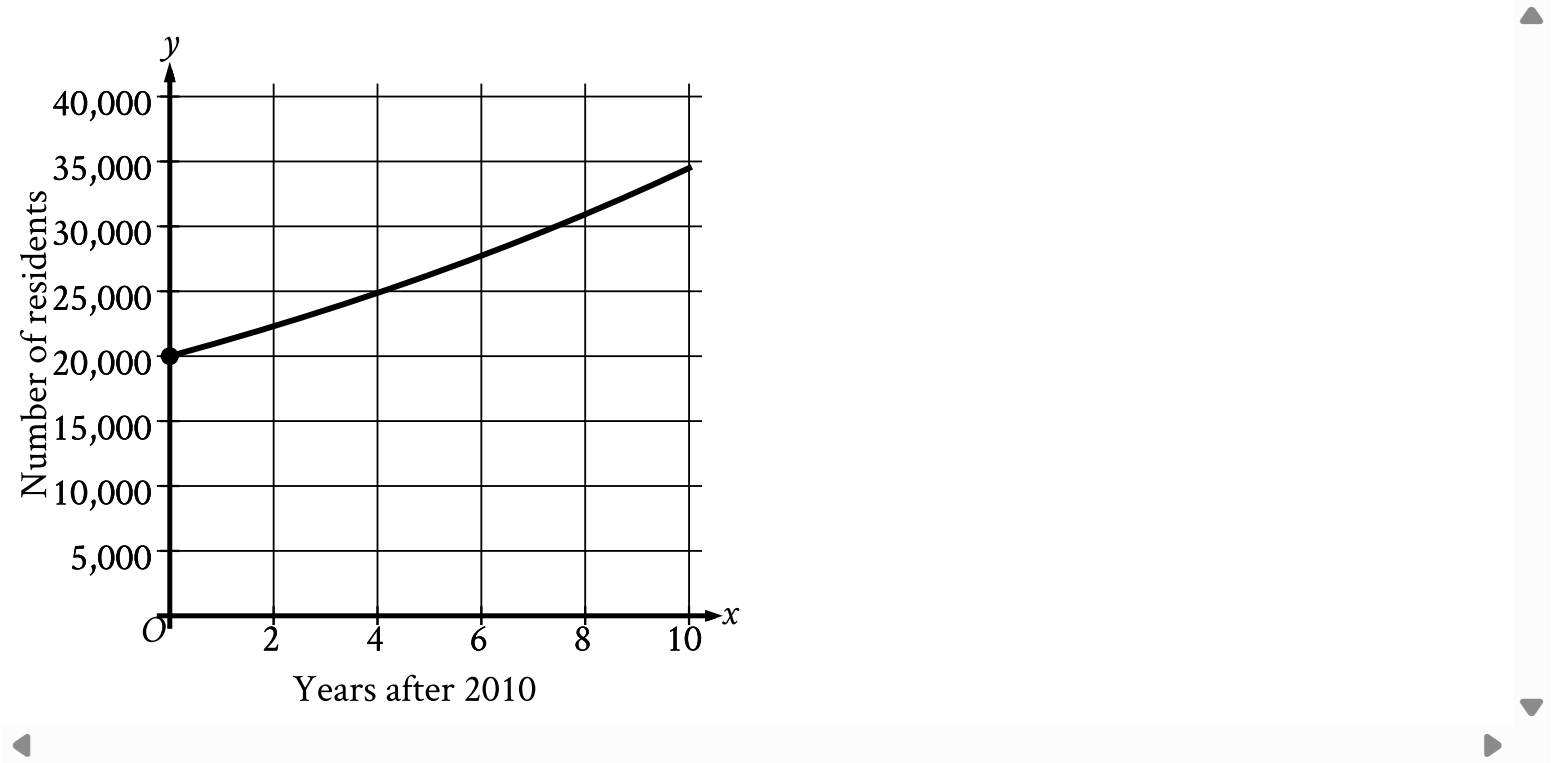


The graph of $y = f(x)$ is shown in the xy -plane. The value of $f(0)$ is an integer. What is the value of $f(0)$?

Question ID 7ef52fbe

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: 7ef52fbe



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

Question ID 7cc9992e

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: 7cc9992e

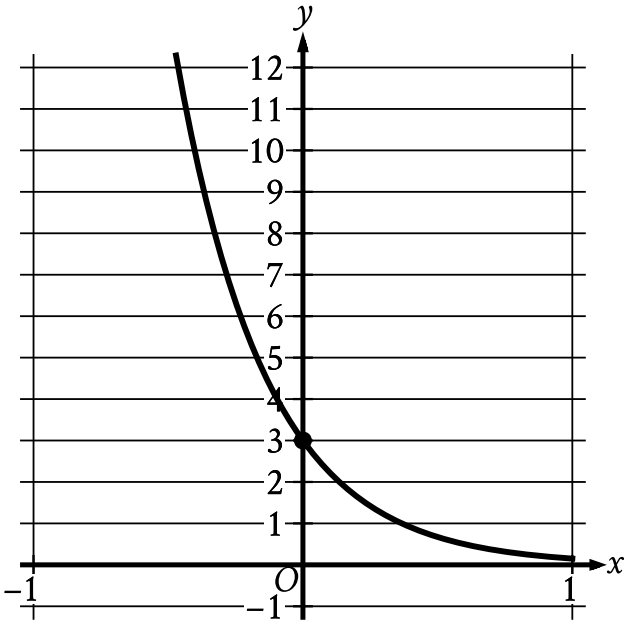
The function f is defined by $f(x) = x^3 + 15$. What is the value of $f(2)$?

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

Question ID c1a7ddea

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: c1a7ddea

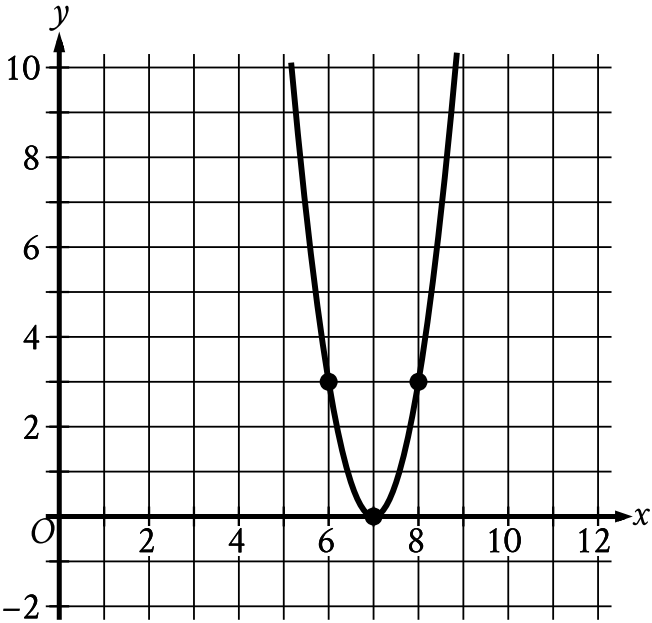


The graph of the exponential function f is shown, where $y = f(x)$. The y -intercept of the graph is $(0, y)$. What is the value of y ?

Question ID 4896d9c5

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: 4896d9c5



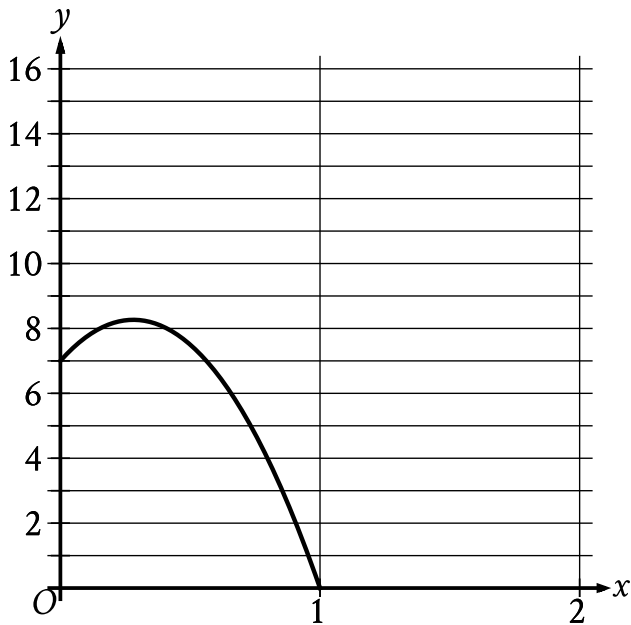
The x -intercept of the graph shown is $(x, 0)$. What is the value of x ?

Question ID 1391c931

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

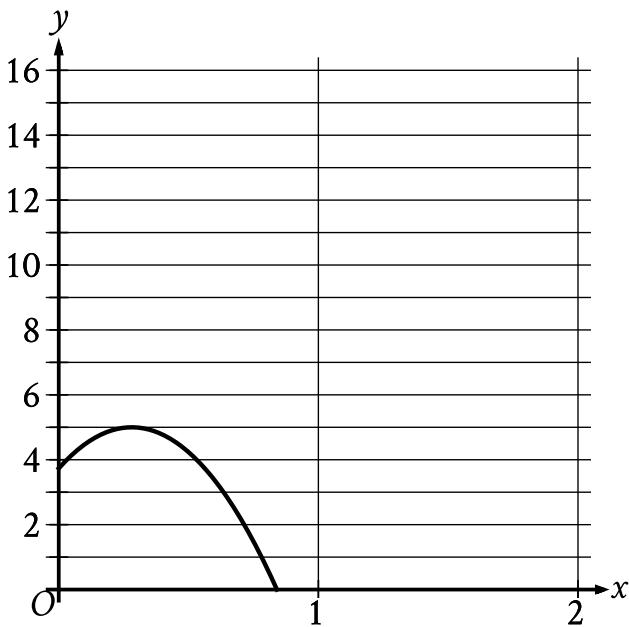
ID: 1391c931

During the first part of an experiment, a ball was launched from a 7-foot-tall platform. The graph shows the height y , in feet, of the ball x seconds after it was launched during the first part of the experiment.

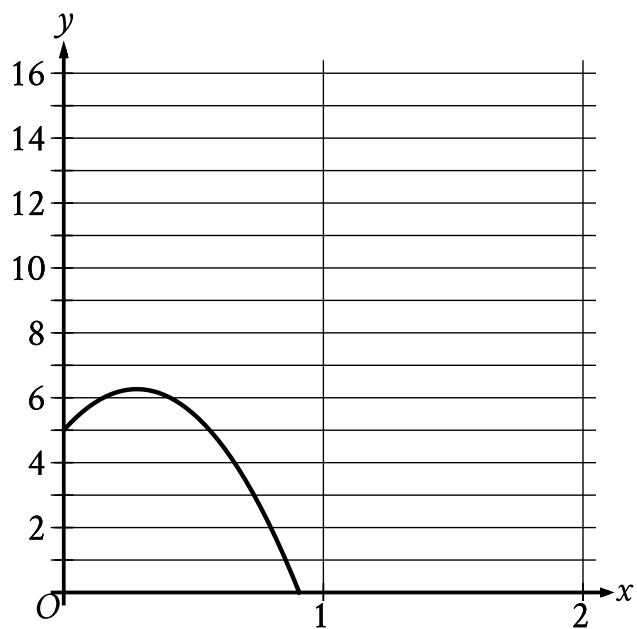


During the second part of the experiment, the ball was launched the same way, but from a platform that is 2 feet shorter than the first platform. Which of the following graphs could represent the height y , in feet, of the ball x seconds after it was launched during the second part of the experiment?

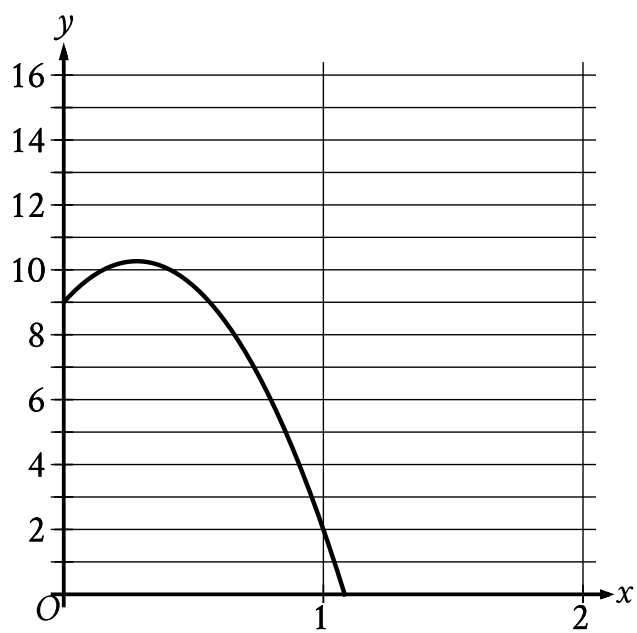
A.



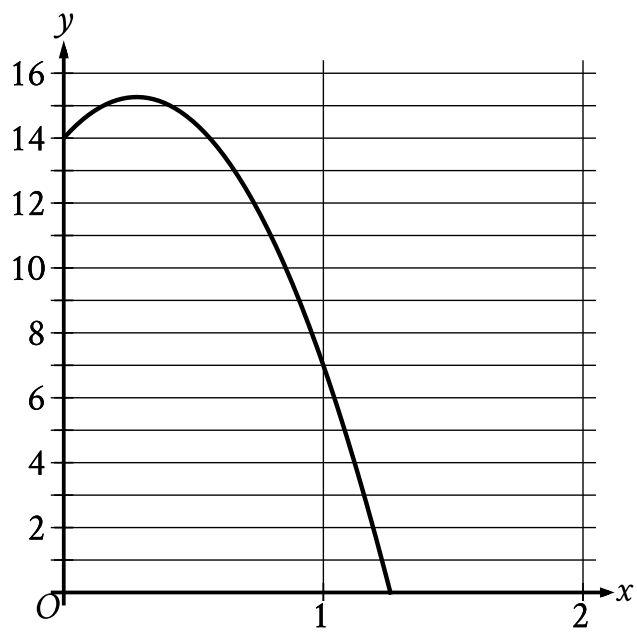
B.



C.



D.



Question ID 3d17c059

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: 3d17c059

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

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.

Question ID 80dc17e1

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: 80dc17e1

At the time of posting a video, a social media channel had **53** subscribers. Each day for five days after the video was posted, the number of subscribers doubled from the number the previous day. Which equation gives the total number of subscribers, n , to the channel d days after the video was posted?

- A. $n = (53)^d$
- B. $n = 53(2)^d$
- C. $n = 53\left(\frac{1}{2}\right)^d$
- D. $n = (53)^2 + d$

Question ID abe39f57

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: abe39f57

The function $f(x) = 240,000(1.22)^x$ gives a company’s predicted annual revenue, in dollars, x years after the company started selling jewelry online, where $0 < x \leq 10$. What is the best interpretation of the statement “ $f(5)$ is approximately equal to 648,650” in this context?

- A. 5 years after the company started selling jewelry online, its predicted annual revenue is approximately 648,650 dollars.
- B. 5 years after the company started selling jewelry online, its predicted annual revenue will have increased by a total of approximately 648,650 dollars.
- C. When the company’s predicted annual revenue is approximately 648,650 dollars, it is 5 times the predicted annual revenue for the previous year.
- D. When the company’s predicted annual revenue is approximately 648,650 dollars, it is 5% greater than the predicted annual revenue for the previous year.

Question ID adb4881c

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: adb4881c

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

Question ID e325a6f4

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: e325a6f4

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

Question ID a1e5d079

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: a1e5d079

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

Question ID 0e881c14

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: 0e881c14

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

Question ID 8f42f8bb

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

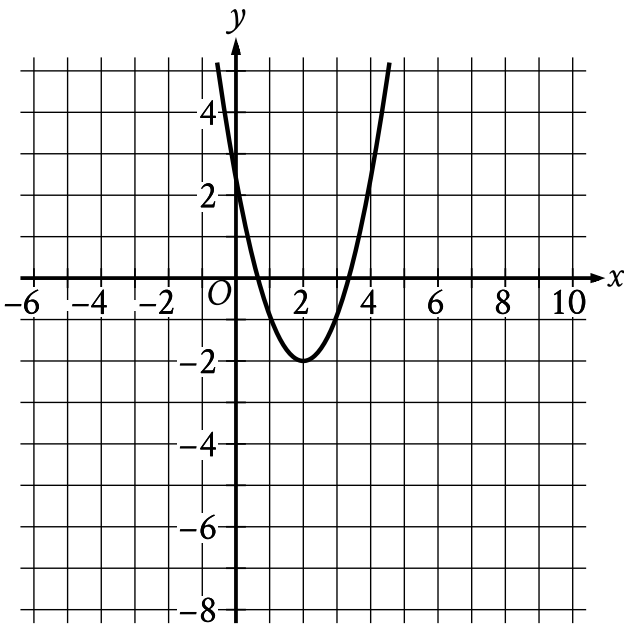
ID: 8f42f8bb

The function f is defined by $f(x) = x^2 + x + 71$. What is the value of $f(2)$?

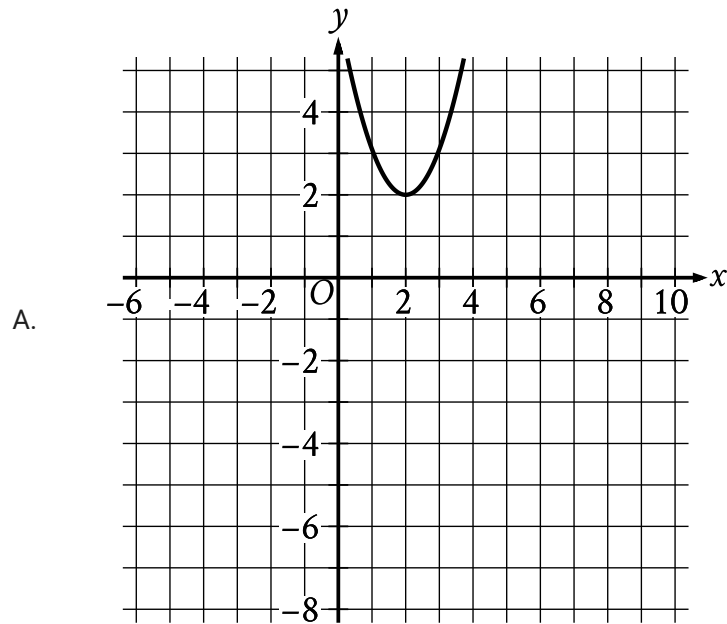
Question ID cea4f5bb

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

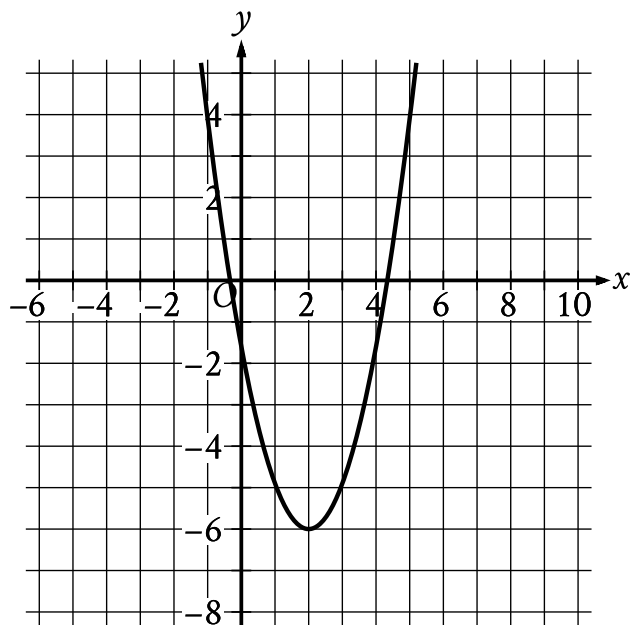
ID: cea4f5bb



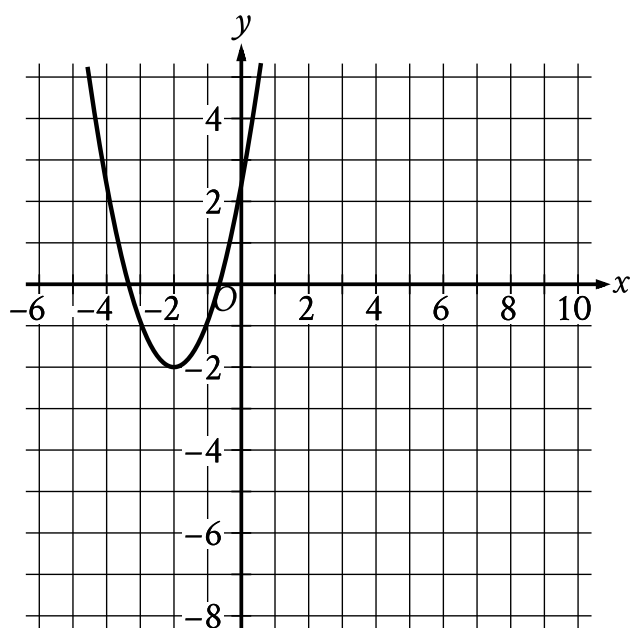
The graph shown will be translated up 4 units. Which of the following will be the resulting graph?



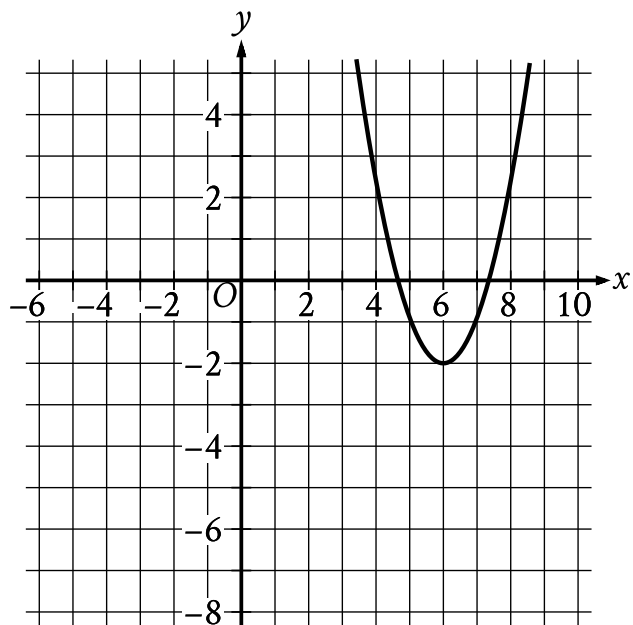
B.



C.



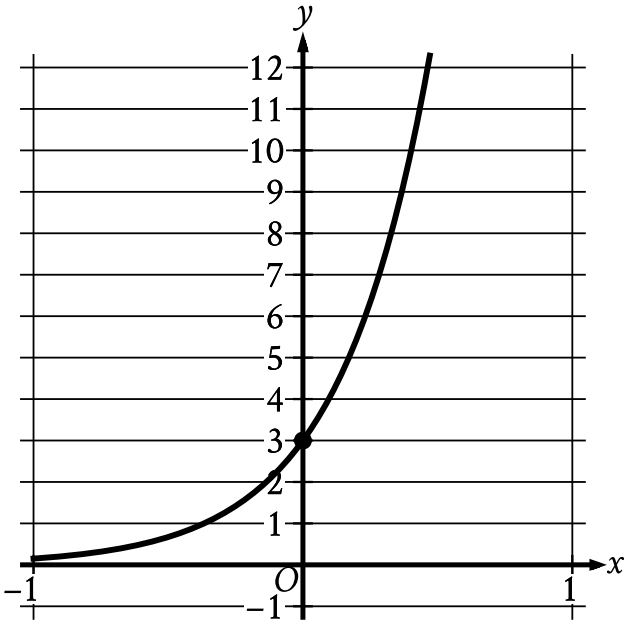
D.



Question ID bf7a9e82

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: bf7a9e82

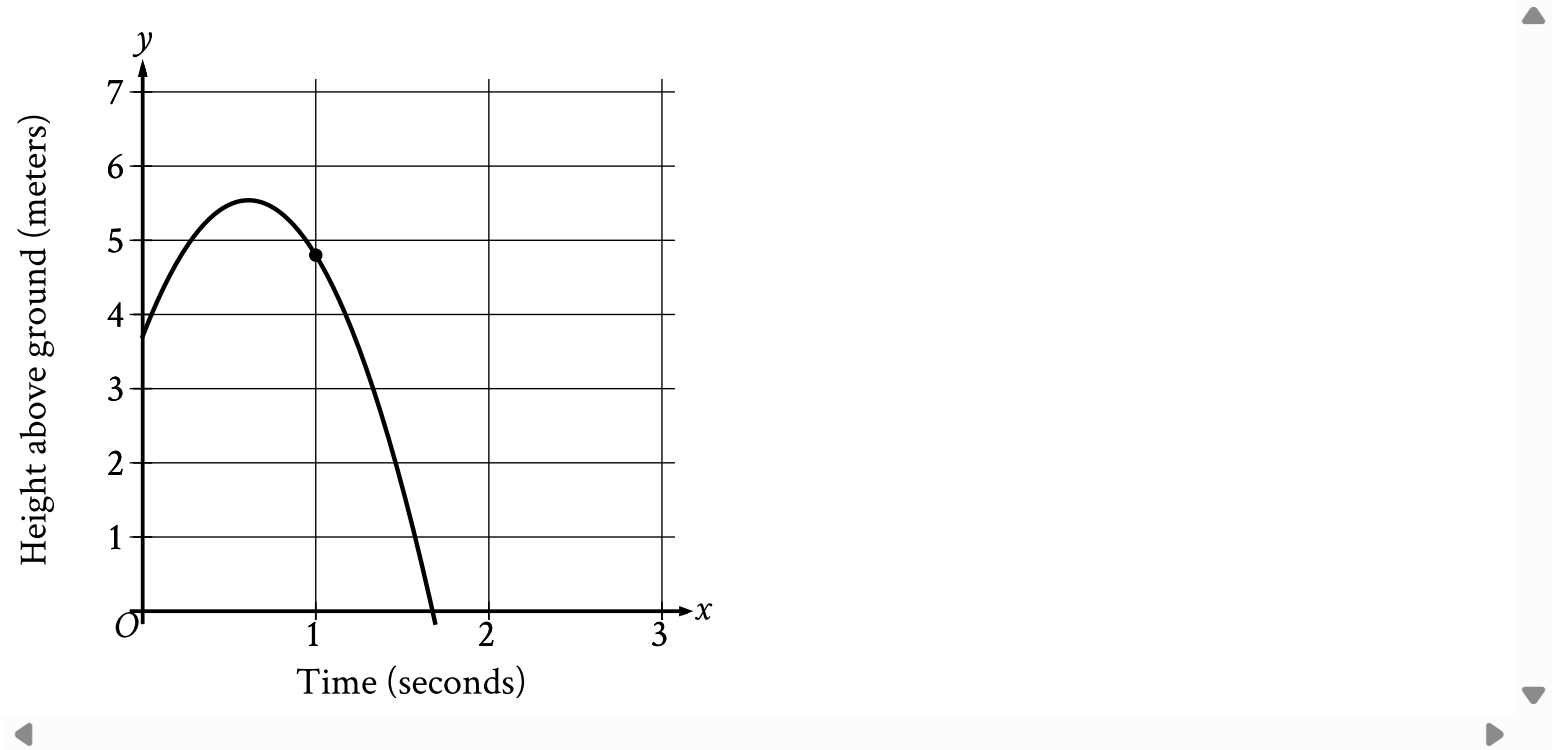


The graph of the exponential function f is shown, where $y = f(x)$. The y -intercept of the graph is $(0, y)$. What is the value of y ?

Question ID a0cf76e5

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: a0cf76e5



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.

Question ID 000e18d5

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: 000e18d5

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.

Question ID 5c4e5729

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: 5c4e5729

$$y = -\frac{1}{4}x^2 + 2x + 29$$

The given equation models a company’s scheduled deliveries over 8 months, where y is the estimated number of scheduled deliveries x months after the end of May 2012, where $0 \leq x \leq 8$. Which statement is the best interpretation of the y-intercept of the graph of this equation in the xy-plane?

- A. At the end of May 2012, the estimated number of scheduled deliveries was 0.
- B. At the end of May 2012, the estimated number of scheduled deliveries was 29.
- C. At the end of June 2012, the estimated number of scheduled deliveries was 0.
- D. At the end of June 2012, the estimated number of scheduled deliveries was 29.

Question ID d1590ce5

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: d1590ce5

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

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.

Question ID 74fbf6c6

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: 74fbf6c6

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.

Question ID ab53bdba

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: ab53bdba

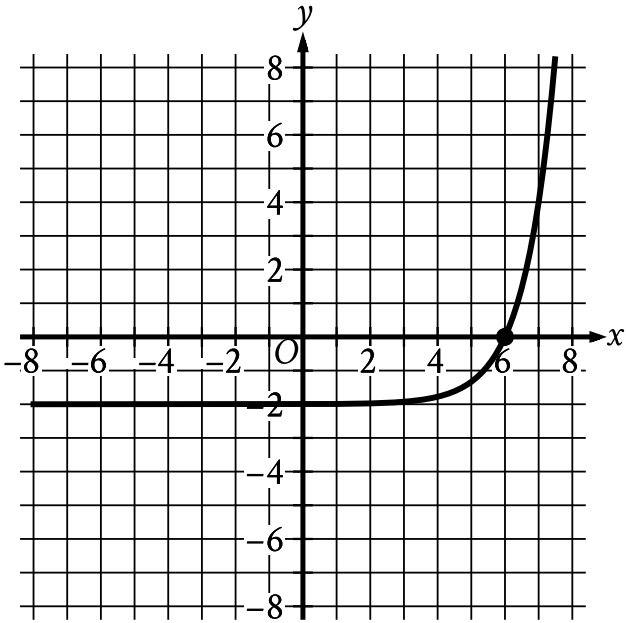
The function g is defined by $g(x) = |x + 18|$. What is the value of $g(4)$?

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

Question ID 788feb1

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: 788feb1

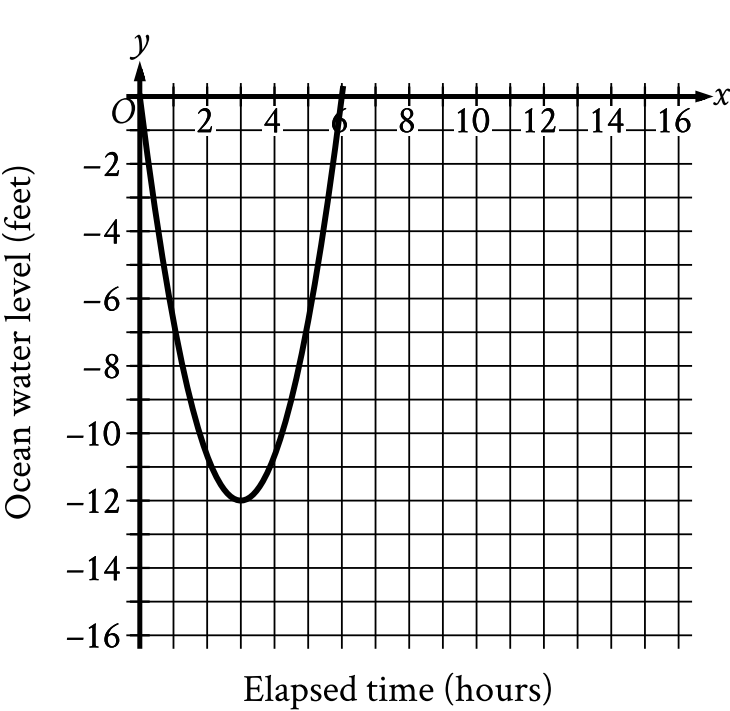


What is the x-coordinate of the x-intercept of the graph shown?

Question ID 15fe2938

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: 15fe2938



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

Question ID d9a7dc38

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: d9a7dc38

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

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

Question ID a4cb920c

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: a4cb920c

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

Question ID 569c8d35

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Advanced Math	Nonlinear functions	

ID: 569c8d35

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