# Question ID 8e3878fd

| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

**ID: 8e3878fd**

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

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 d08a5d15

| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

**ID: d08a5d15**

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 21be3fbd

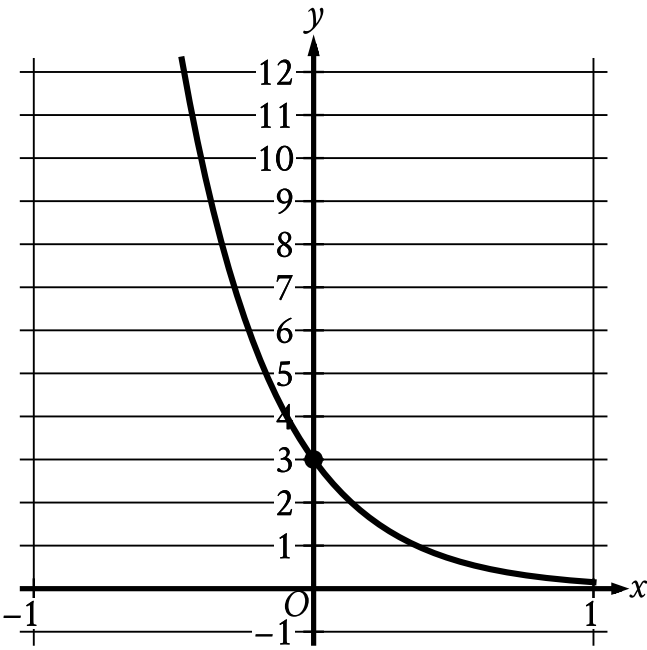| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

**ID: 21be3fbd**

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 feea2bbd

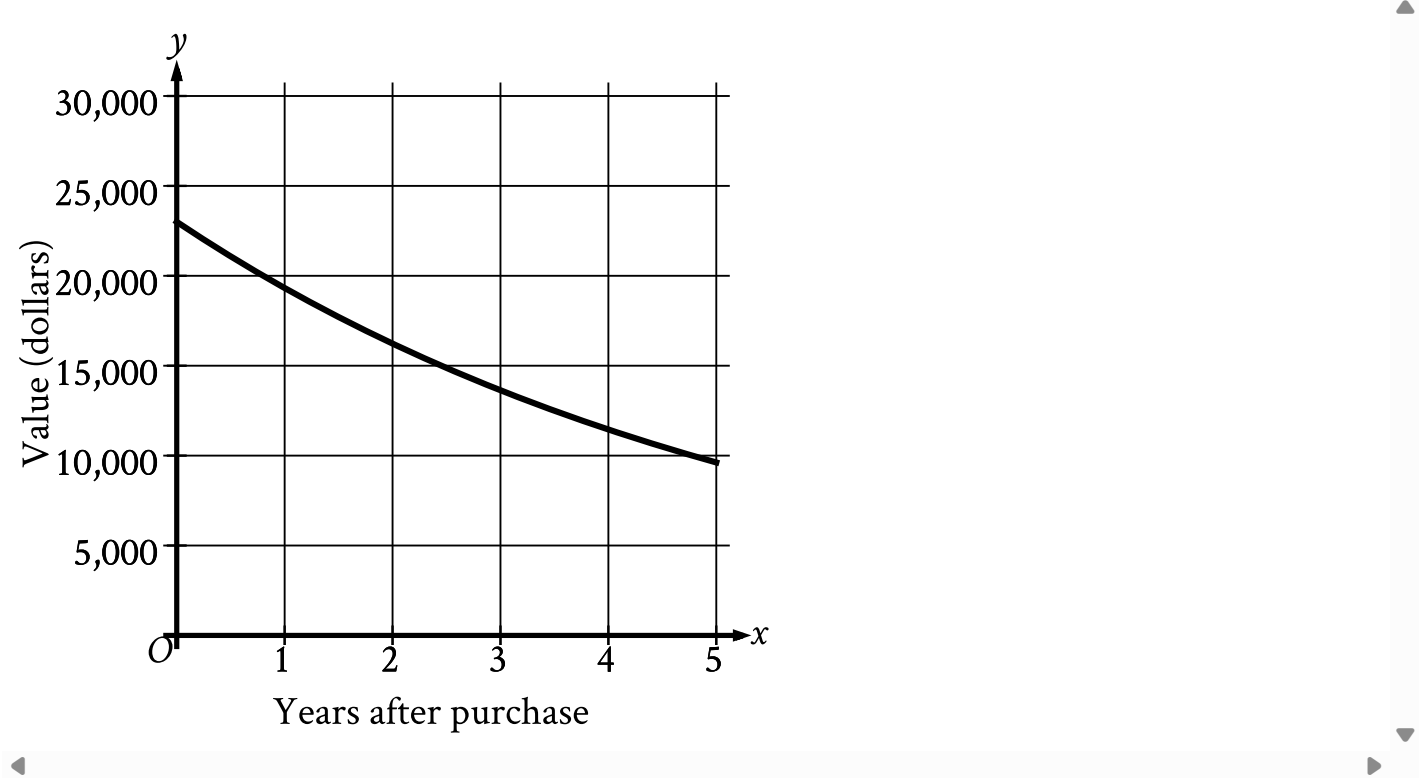| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

**ID: feea2bbd**



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 ba5a8050

| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

**ID: ba5a8050**

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

# Question ID e2abeaa7

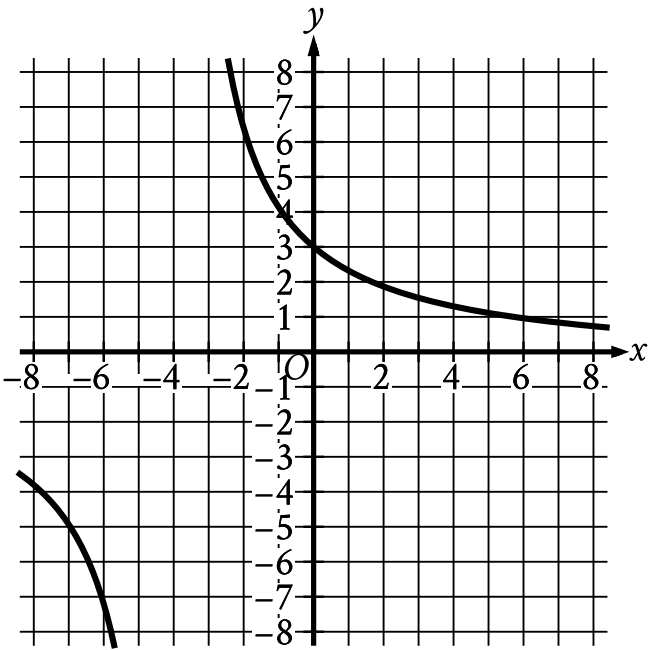| Assessment | Test | Domain | Skill | Difficulty |
|------------|------|--------|-------|------------|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

**ID: e2abeaa7**

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 506336f9

| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

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 dabcd1a8

| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

**ID: dabcd1a8**

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

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 c3018583

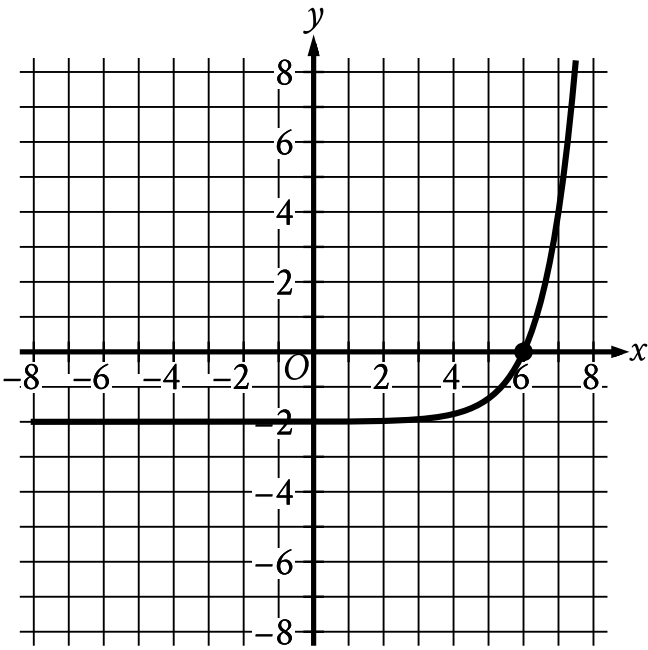| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

**ID: c3018583**

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. $h(n) = 85$<mark>msup</mark>

D. $h(n) = 85(0.85)^n$

# Question ID 71dfd66d

| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

ID: 71dfd66d



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

# Question ID 32f0047f

| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

**ID: 32f0047f**

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

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 5a0d5e4b

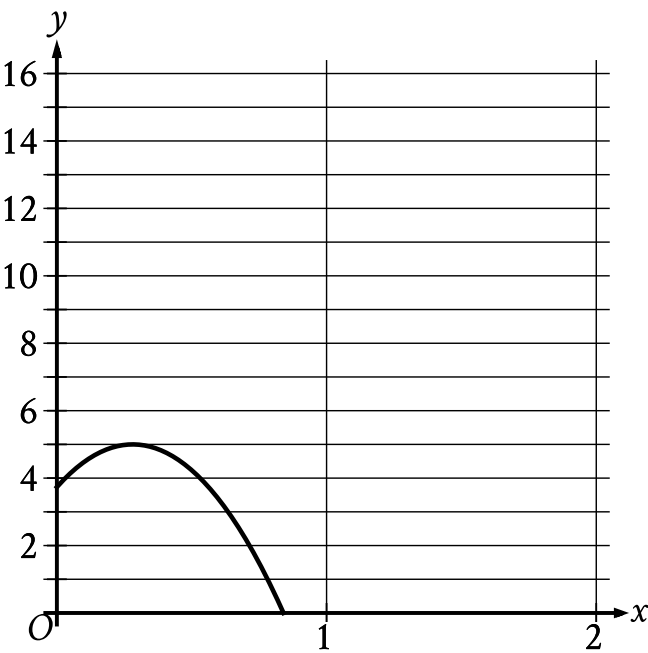| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

**ID: 5a0d5e4b**

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.
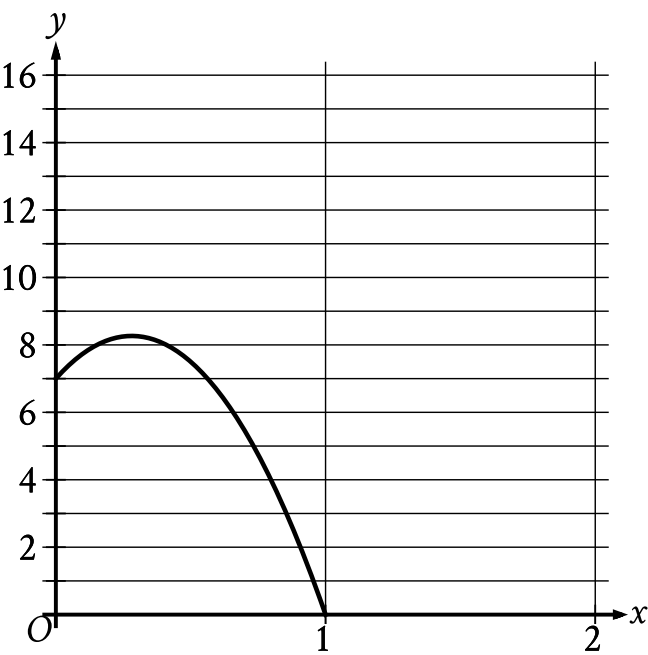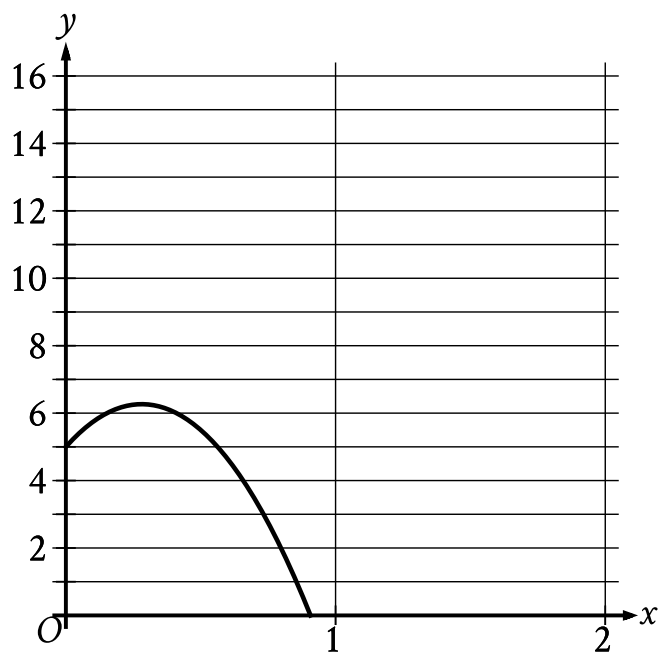


During the second part of the experiment, the ball was launched the same way, but from a platform that is $2$ feet shorter than the first platform. Which of the following graphs could represent the height $y$, in feet, of the ball $x$ seconds after it was launched during the second part of the experiment?
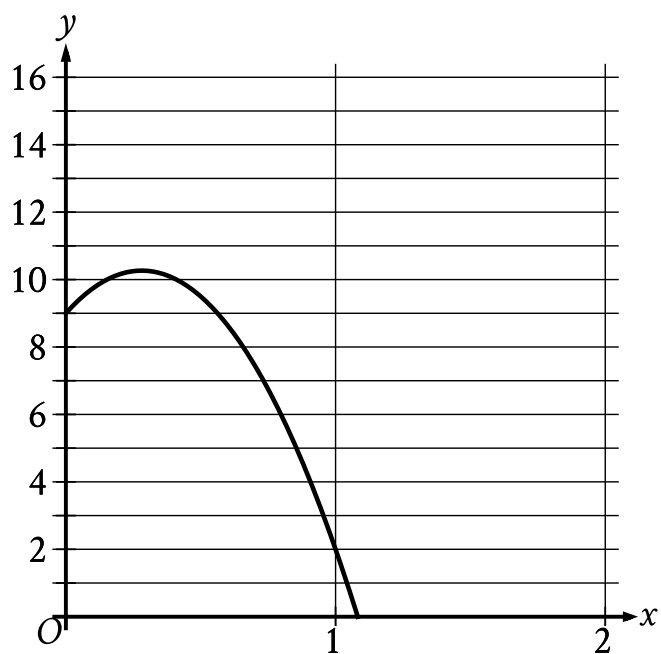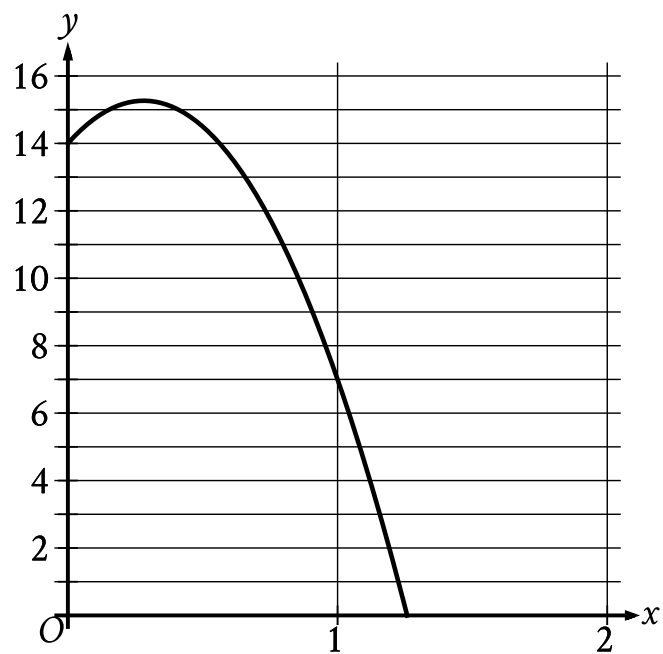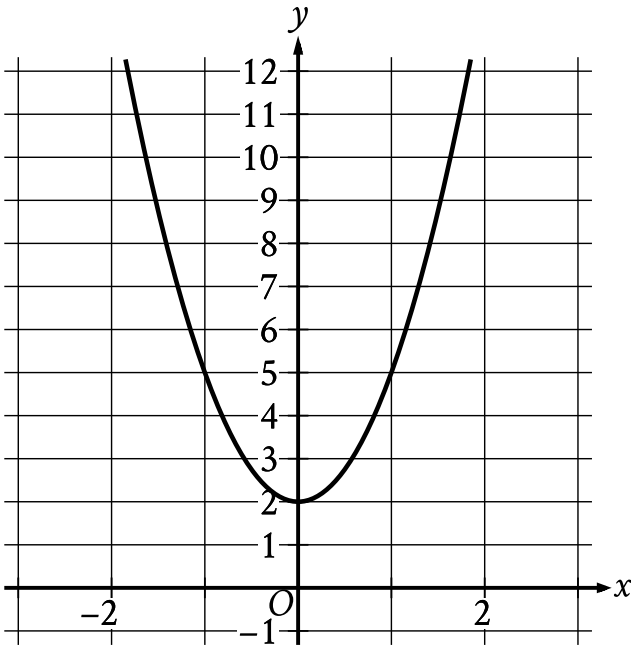
A.

B.



C.

D.

# Question ID 0b95a3c1

| Assessment | Test | Domain | Skill | Difficulty |
|------------|------|--------|-------|------------|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

**ID: 0b95a3c1**



The graph of the quadratic function $y = f(x)$ is shown. What is the vertex of the graph?

A. $(0, -2)$

B. $(0, -3)$

C. $(0, 2)$

D. $(0, 3)$

# Question ID e00137af

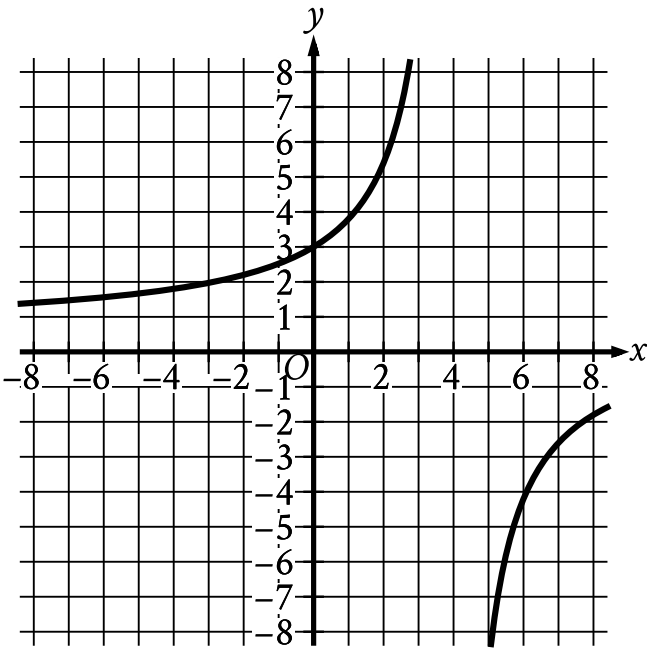| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

**ID: e00137af**

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 7f26b325

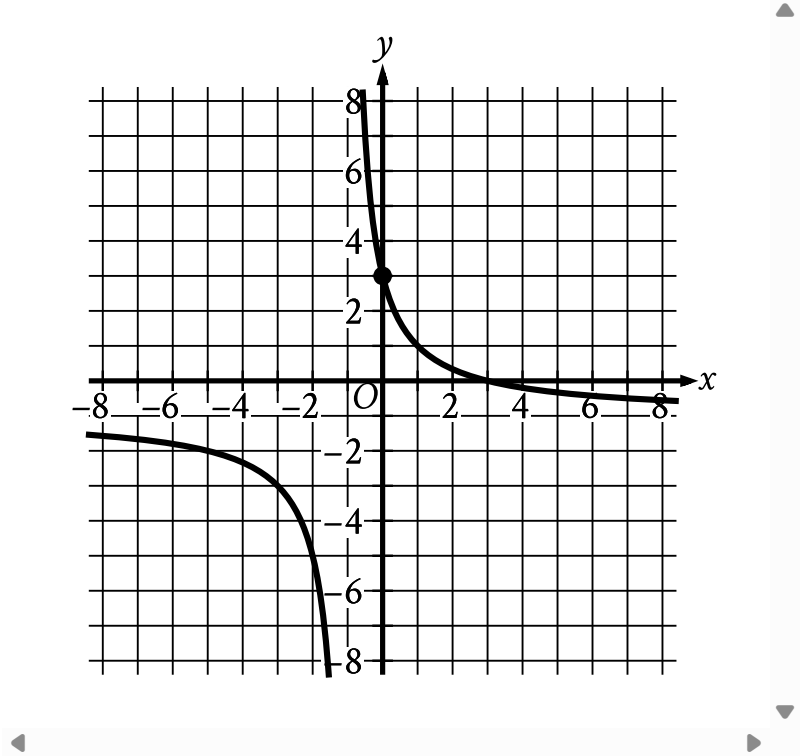| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

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. $3$

# Question ID 49f6315b

| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

ID: 49f6315b



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

# Question ID 14a9a45d

| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

**ID: 14a9a45d**

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. $\frac{1}{18}$

# Question ID 74b8e0a0

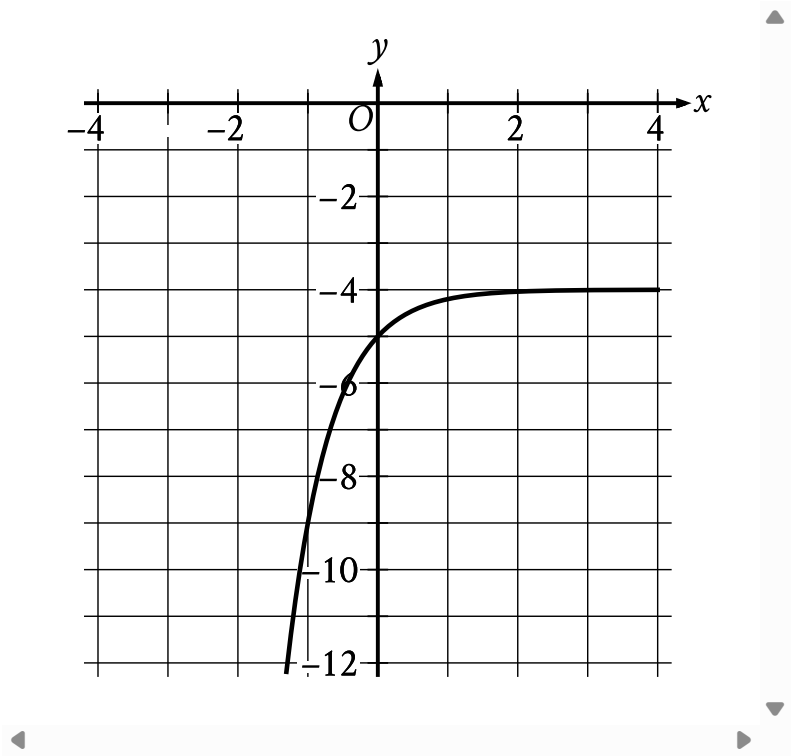| Assessment | Test | Domain | Skill | Difficulty |
|------------|------|--------|-------|------------|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

**ID: 74b8e0a0**

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. $17$

# Question ID 9322d5de

**ID: 9322d5de**



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

A. $(-1, -9)$

B. $(0, -5)$

C. $(0, -4)$

D. $(0, 0)$

# Question ID bb4474ea

| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

**ID: bb4474ea**

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. $10$

# Question ID 5964ec17

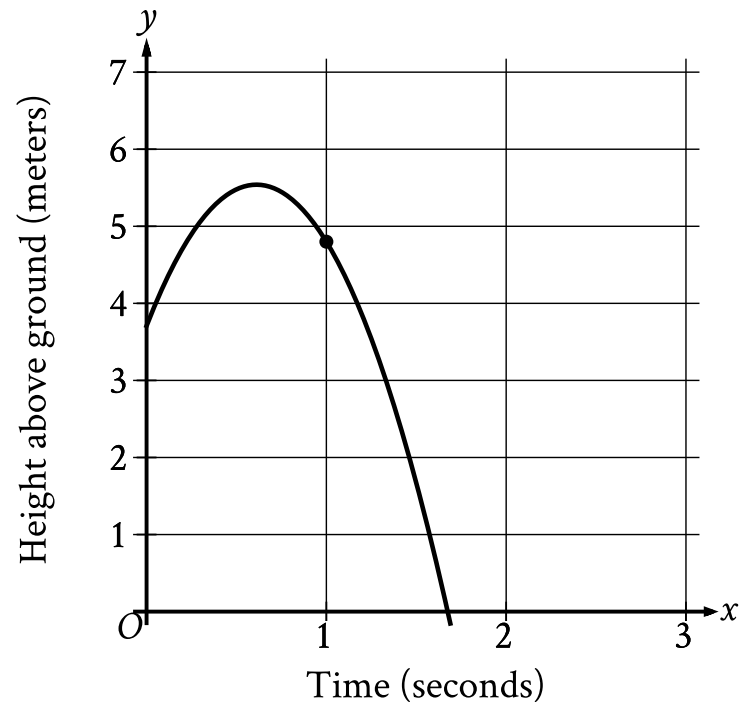| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

**ID: 5964ec17**

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

# Question ID 67906a7c

**ID: 67906a7c**



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 76bb62a9

| Assessment | Test | Domain | Skill | Difficulty |
|------------|------|--------|-------|------------|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

**ID: 76bb62a9**

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 ec6f1063

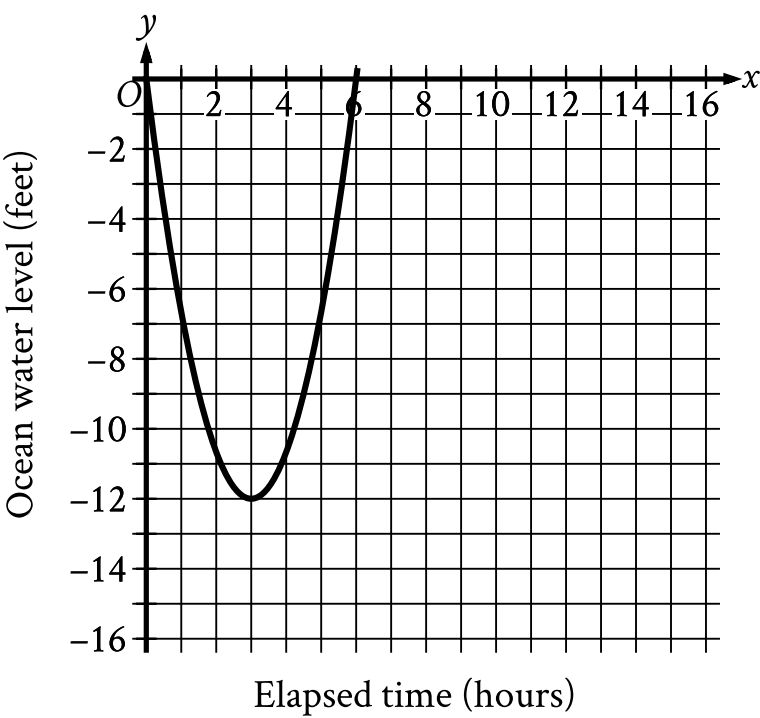| Assessment | Test | Domain | Skill | Difficulty |
|------------|------|--------|-------|------------|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

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 1bb4e088

| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

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 f89a2cb0

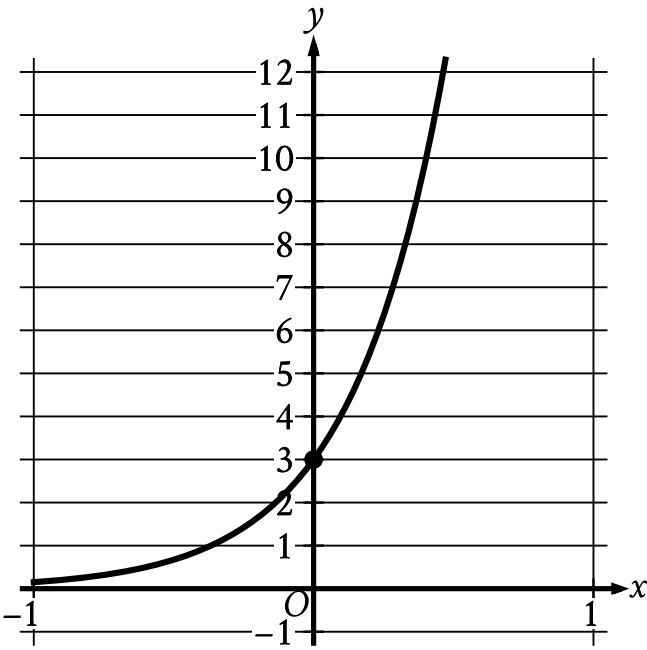| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |
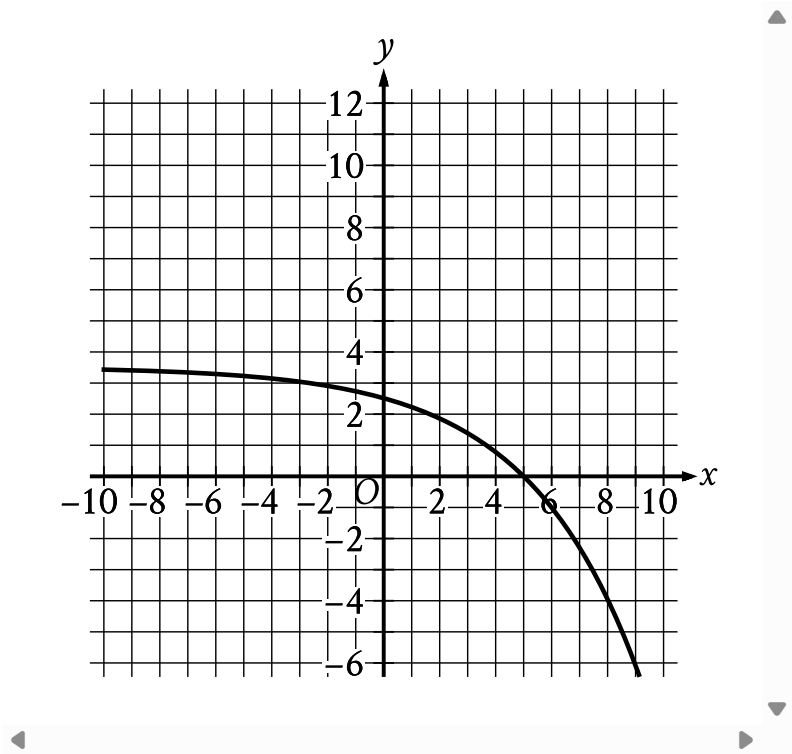
What is the *x*-intercept of the graph shown?

A. $(-5, 0)$

B. $(5, 0)$

C. $(-2, 0)$

D. $(2, 0)$

# Question ID 066299f1

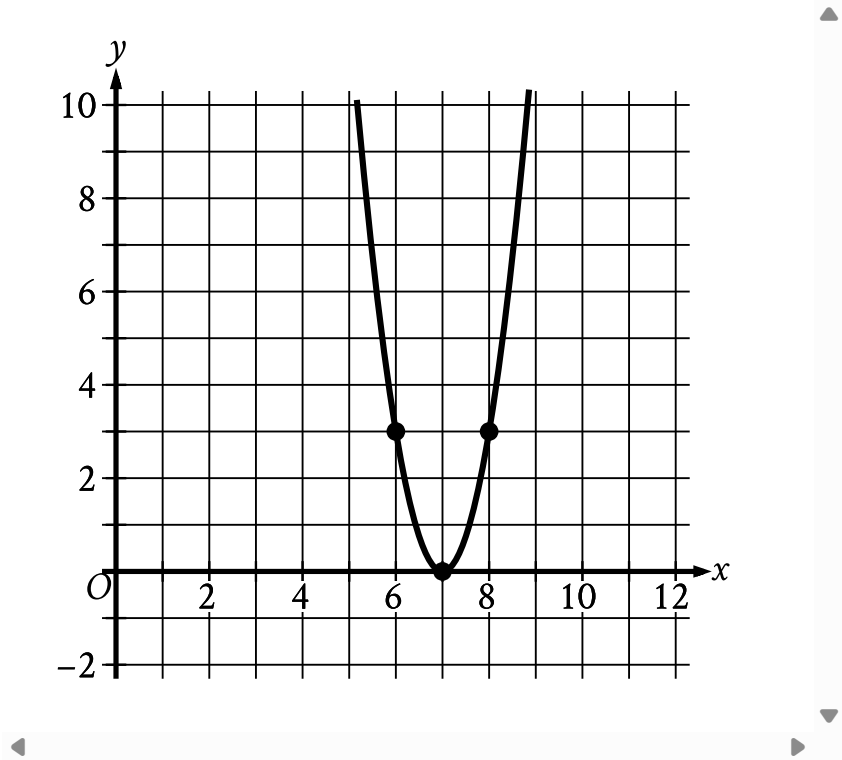| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

ID: 066299f1



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 afa732b9

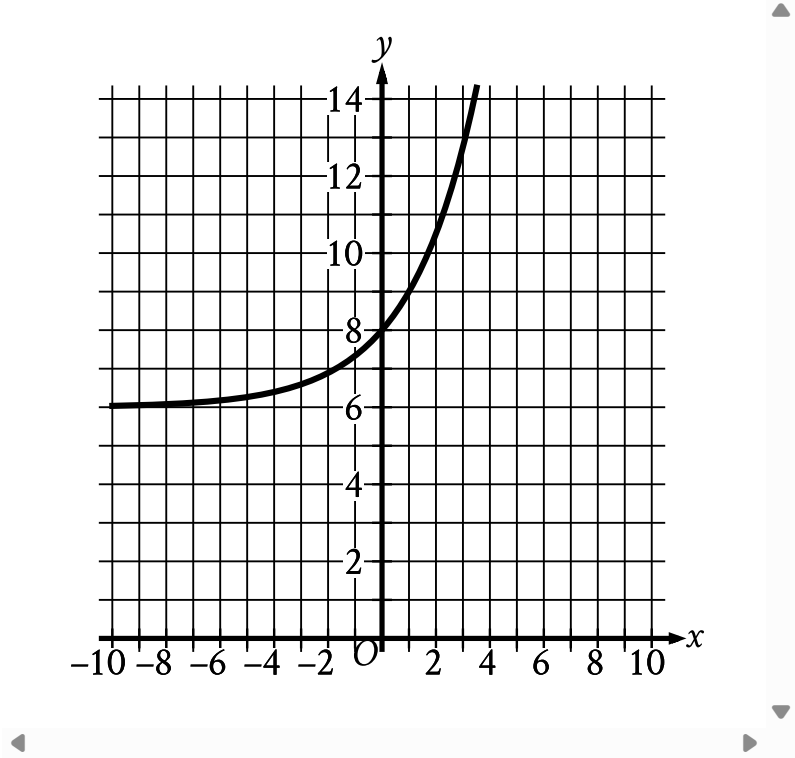| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

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

# Question ID f8879c84

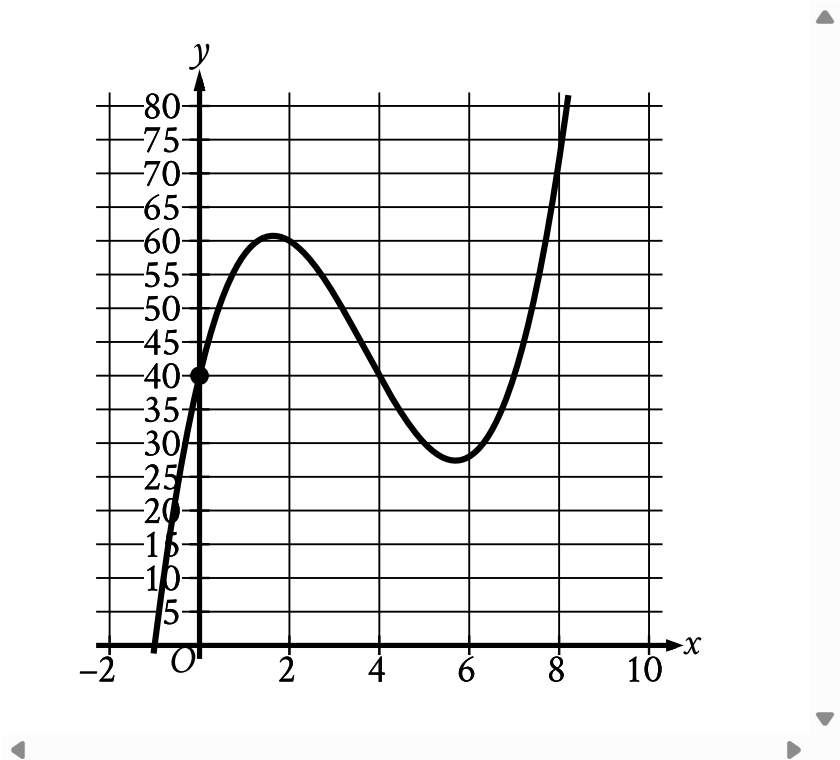| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

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

A. $(-8, 0)$

B. $(-6, 0)$

C. $(0, 6)$

D. $(0, 8)$

# Question ID ff31d6d6

| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

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

# Question ID a2786d4b

| Assessment | Test | Domain | Skill | Difficulty |
|------------|------|--------|-------|------------|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

**ID: a2786d4b**

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

# Question ID 07173576

| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

**ID: 07173576**

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

# Question ID d25b0c19

| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

**ID: d25b0c19**

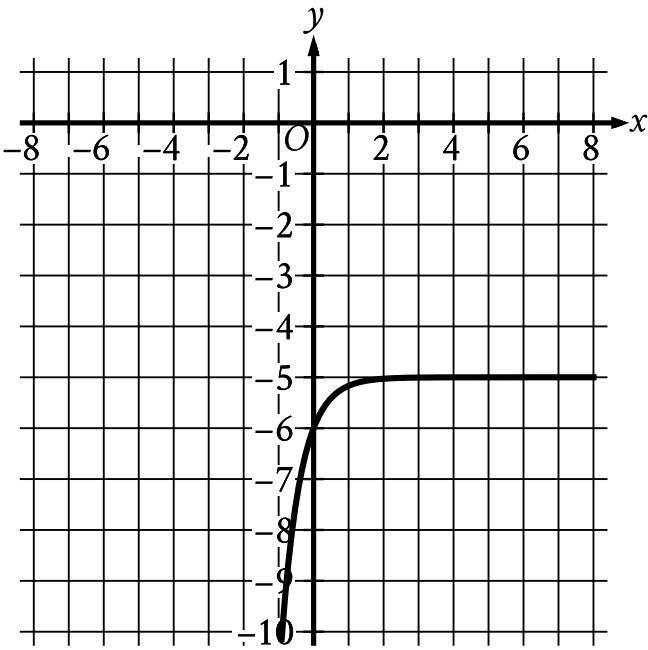The function $f$ is defined by $f(x) = x^3 + 15$. What is the value of $f(2)$?

A. $20$

B. $21$

C. $23$

D. $24$

# Question ID f4d12865

| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

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

A. $(0, -6)$

B. $(-6, 0)$

C. $(0, 0)$

D. $(-5, -5)$

# Question ID 8a3fa8c4

| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

**ID: 8a3fa8c4**

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 fb559c97

| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

ID: fb559c97

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 $0 < x \le 10$. 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 cbfcd000

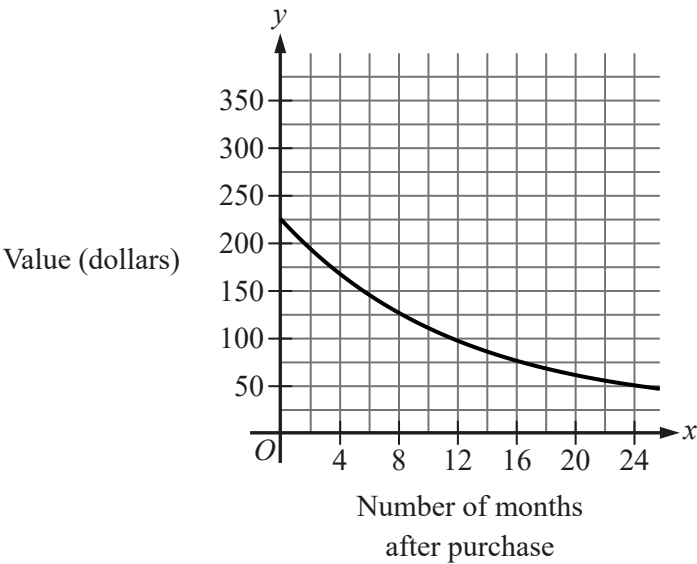| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

**ID: cbfcd000**

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 74e3e032

| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

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 0ad45980

| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |
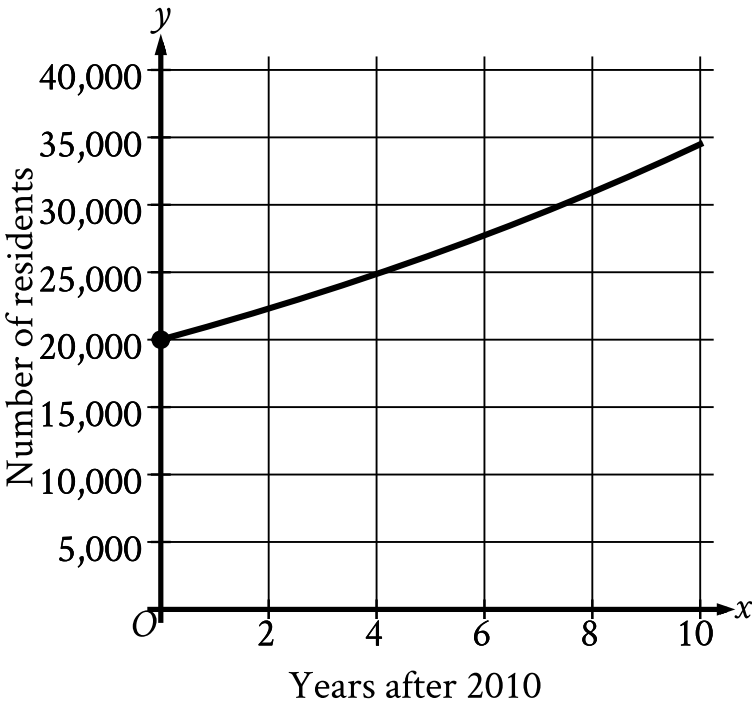
The graph shown models the number of residents of a certain city $x$ years after $2010$. How many residents does this model estimate the city had in $2010$?

A. $0$

B. $2,000$

C. $20,000$

D. $25,000$

# Question ID d6b10177

| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |
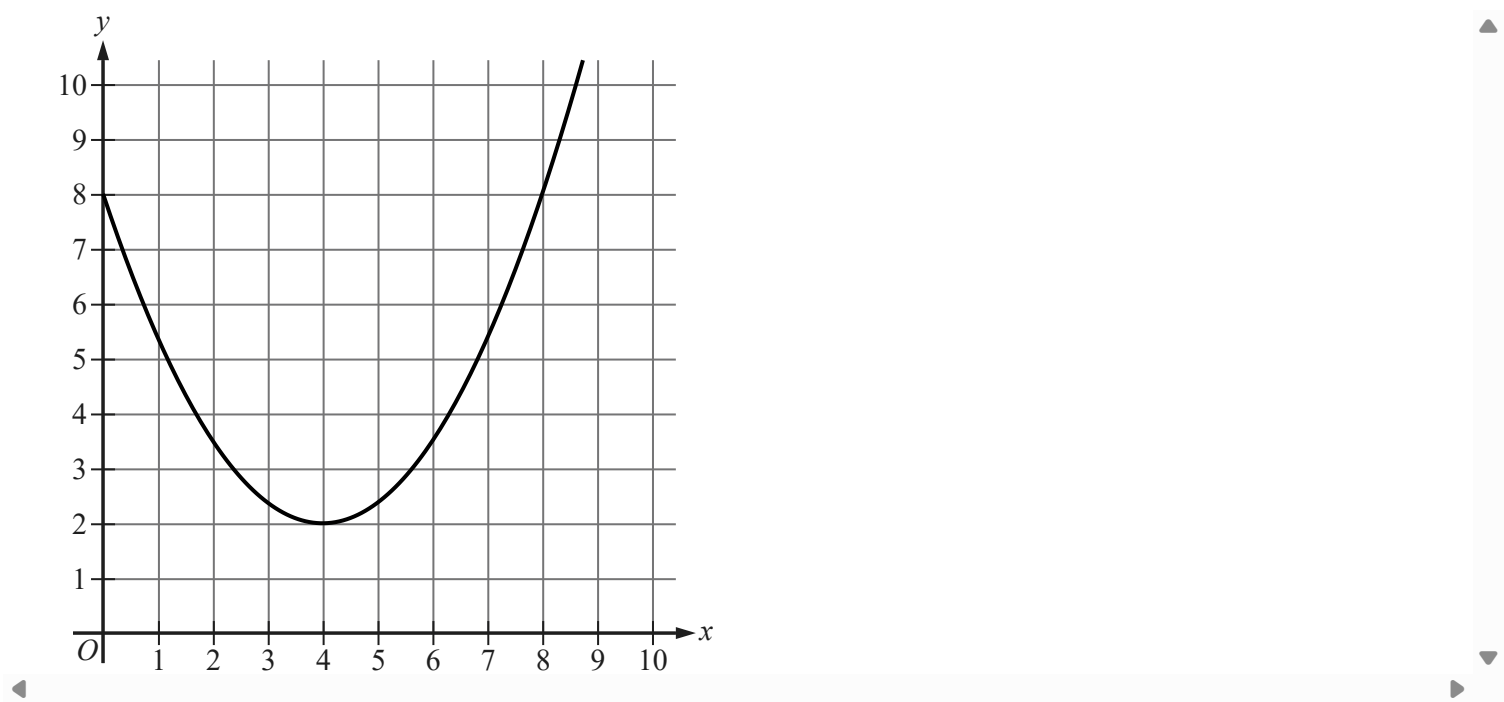
The graph shows a marble's height above the ground $y$, in inches, $x$ seconds after it started moving on an elevated track of a marble run. Which of the following is the best interpretation of the $y$-intercept of the graph?

A. The marble's height was $0$ inches above the ground $8$ seconds after it started moving.

B. The marble's height was $8$ inches above the ground when it started moving.

C. The marble's minimum height was $0$ inches above the ground.

D. The marble's minimum height was $8$ inches above the ground.

# Question ID f8a41cc8

| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

**ID: f8a41cc8**

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 = $ msup

B. $n = 53(2)^d$

C. $n = 53$ msup

D. $n = $ msup $ + d$

# Question ID 5ba6bd07

| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

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

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 4f5ff634

| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |
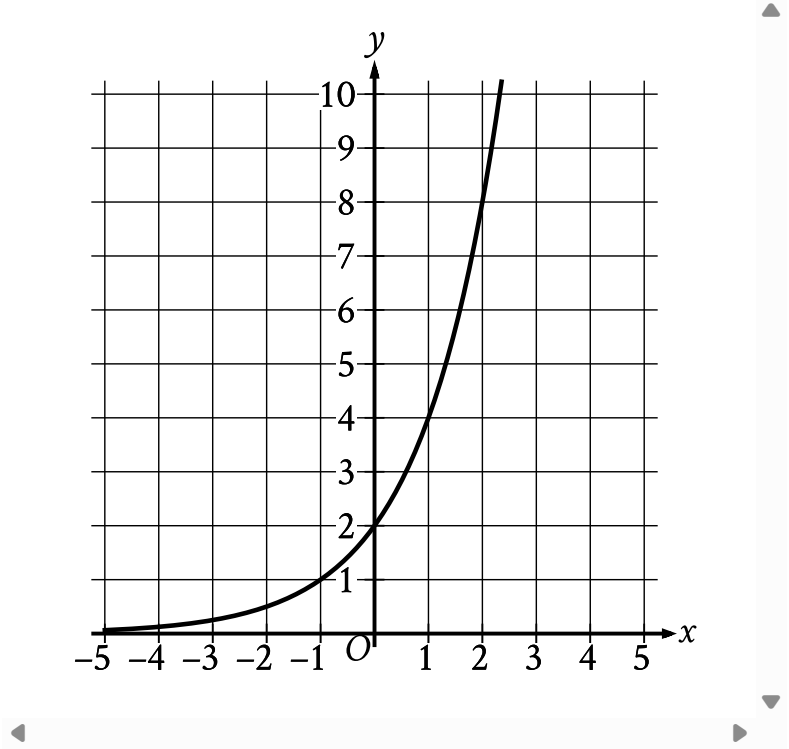
What is the *y*-intercept of the graph shown?

A. $(0, 0)$

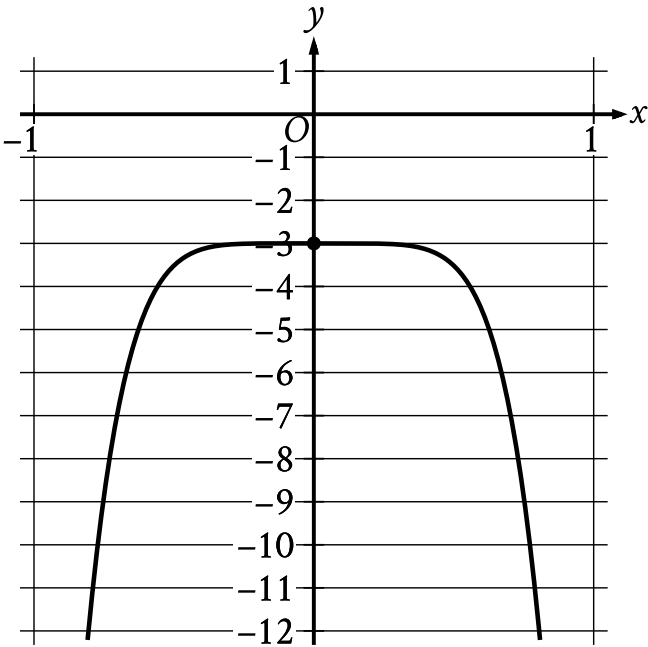B. $(0, 2)$

C. $(2, 0)$

D. $(2, 2)$

# Question ID f4006172

**ID: f4006172**
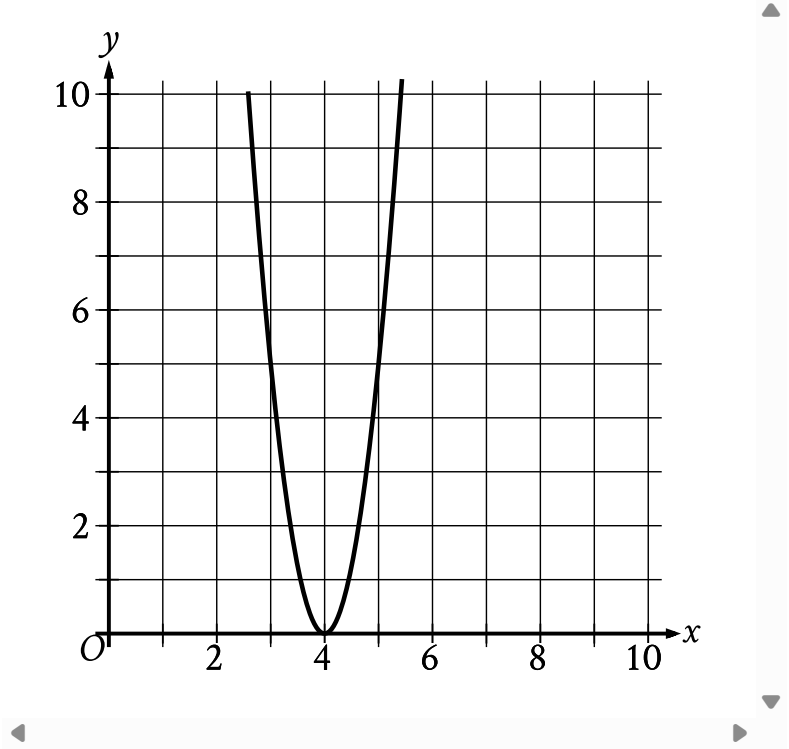


What is the *x*-intercept of the graph shown?

A. $(-5, 0)$

B. $(5, 0)$

C. $(-4, 0)$

D. $(4, 0)$

# Question ID 089483cd

ID: 089483cd



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 $y$?

# Question ID a4ac7f91

| Assessment | Test | Domain | Skill | Difficulty |
|------------|------|--------|-------|------------|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

**ID: a4ac7f91**

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. $64$

# Question ID b5b477cb

| Assessment | Test | Domain | Skill | Difficulty |
|------------|------|--------|-------|------------|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

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. $M(t) = 890(2)^{\frac{t}{10}}$
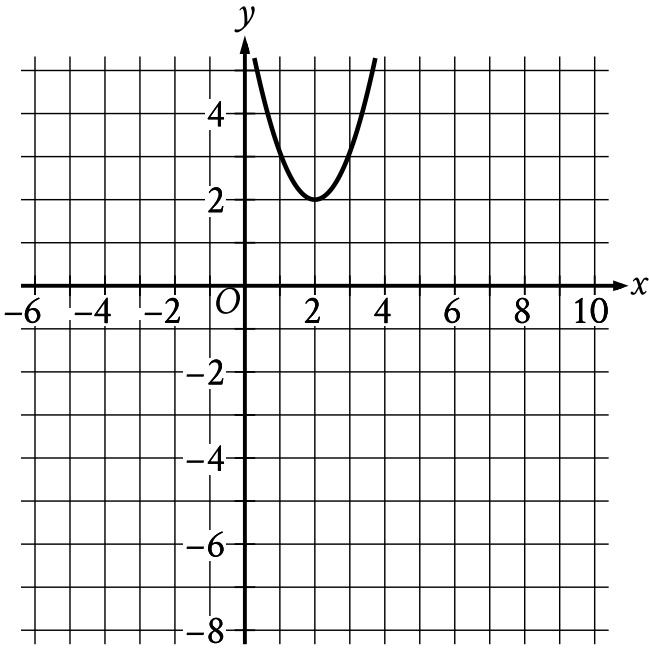
D. $M(t) = 890(10)^{\frac{t}{2}}$

# Question ID f163697b

**ID: f163697b**
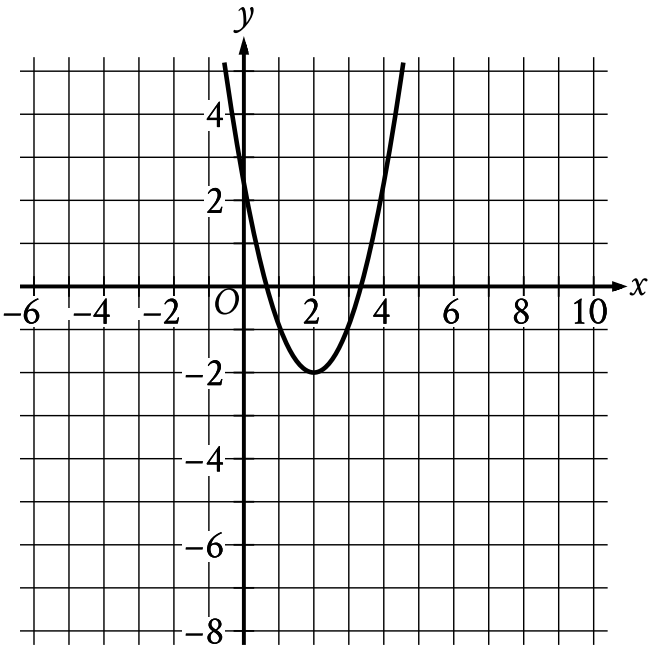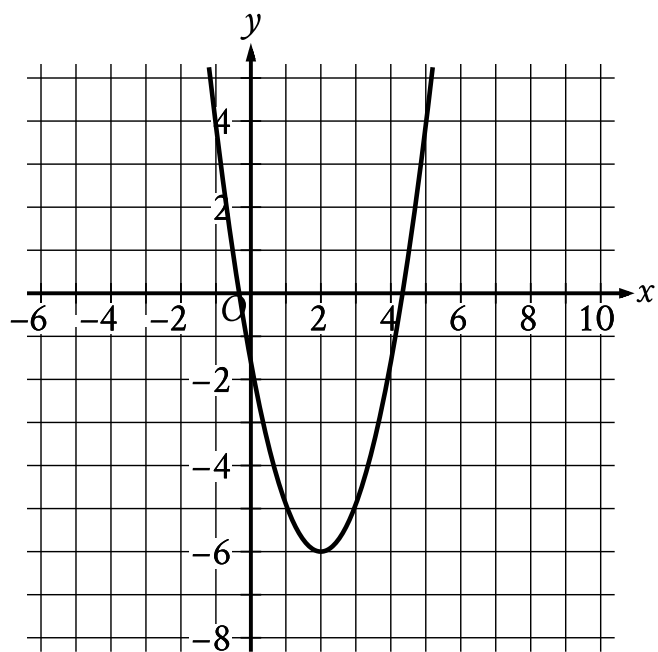


The graph shown will be translated up $4$ units. Which of the following will be the resulting graph?

A.

B.



C.
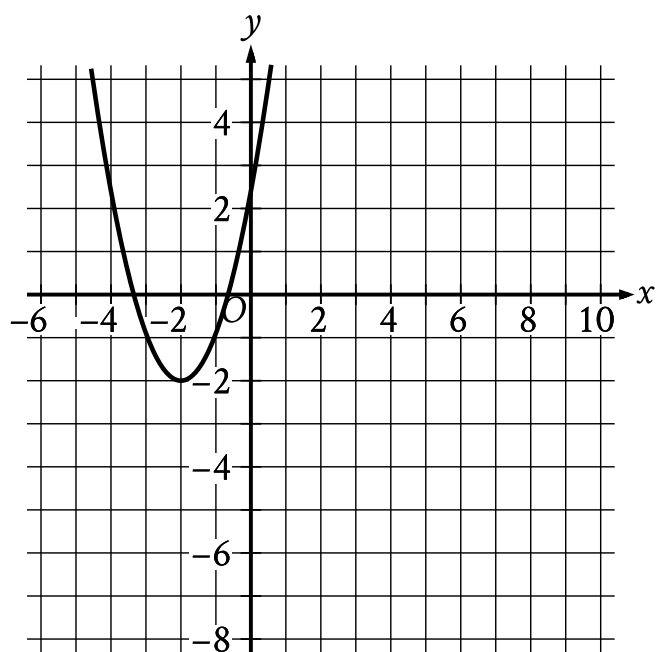
D.

# Question ID e577d895
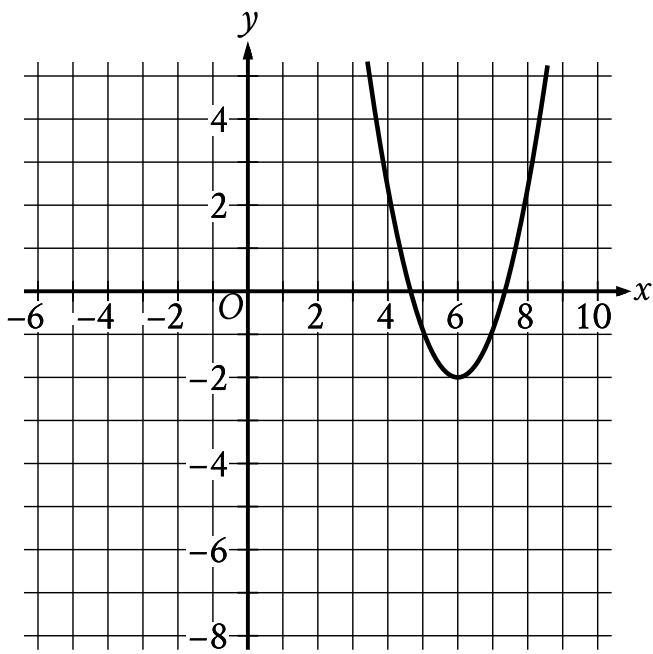
| Assessment | Test | Domain | Skill | Difficulty |
|------------|------|--------|-------|------------|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |

**ID: e577d895**

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 $0 < x \le 10$. 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 df0ef976

| Assessment | Test | Domain | Skill | Difficulty |
|---|---|---|---|---|
| SAT | Math | Advanced Math | Nonlinear functions | Easy |
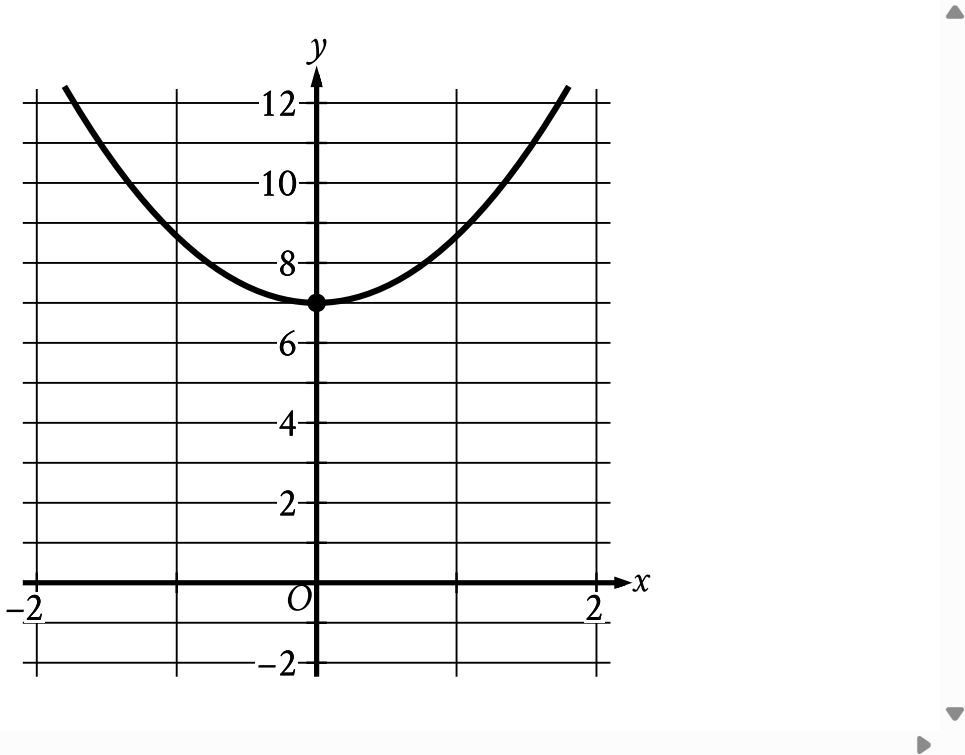
The parabola shown intersects the $y$-axis at the point $(x, y)$. What is the value of $y$?