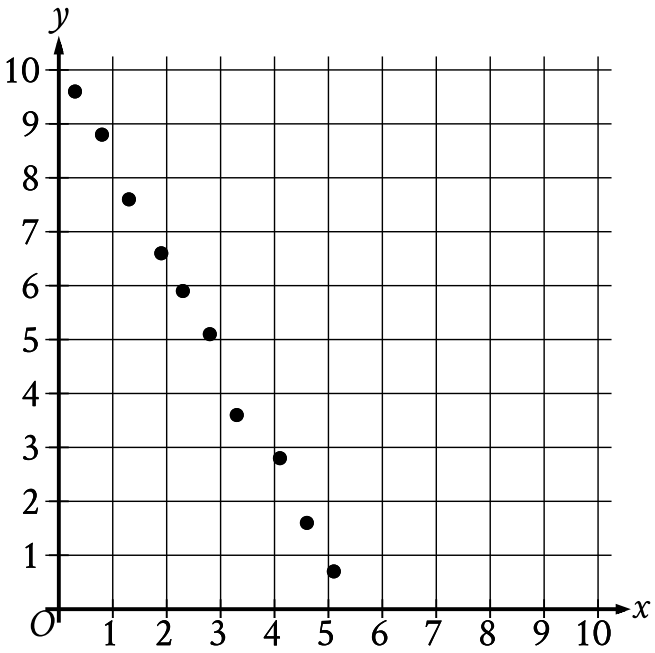
Question ID a6541d64

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	Easy

ID: a6541d64



Which of the following equations is the most appropriate linear model for the data shown in the scatterplot?

A. $y = -1.9x - 10.1$

B. $y = -1.9x + 10.1$

C. $y = 1.9x - 10.1$

D. $y = 1.9x + 10.1$

ID: a6541d64 Answer

Correct Answer: B

Rationale

Choice B is correct. The equation representing a linear model can be written in the form $y = a + bx$, or $y = bx + a$, where b is the slope of the graph of the model and $(0, a)$ is the *y*-intercept of the graph of the model. The scatterplot shows that as the *x*-values of the data points increase, the *y*-values of the data points decrease, which means the graph of an appropriate linear model has a negative slope. Therefore, $b < 0$. The scatterplot also shows that the data points are close to the *y*-axis at a positive value of y. Therefore, the *y*-intercept of the graph of an appropriate linear model has a positive *y*-coordinate, which

means $a > 0$. Of the given choices, only choice B, $y = -1.9x + 10.1$, has a negative value for b, the slope, and a positive value for a, the *y*-coordinate of the *y*-intercept.

Choice A is incorrect. The graph of this model has a *y*-intercept with a negative *y*-coordinate, not a positive *y*-coordinate.

Choice C is incorrect. The graph of this model has a positive slope, not a negative slope, and a *y*-intercept with a negative *y*-coordinate, not a positive *y*-coordinate.

Choice D is incorrect. The graph of this model has a positive slope, not a negative slope.

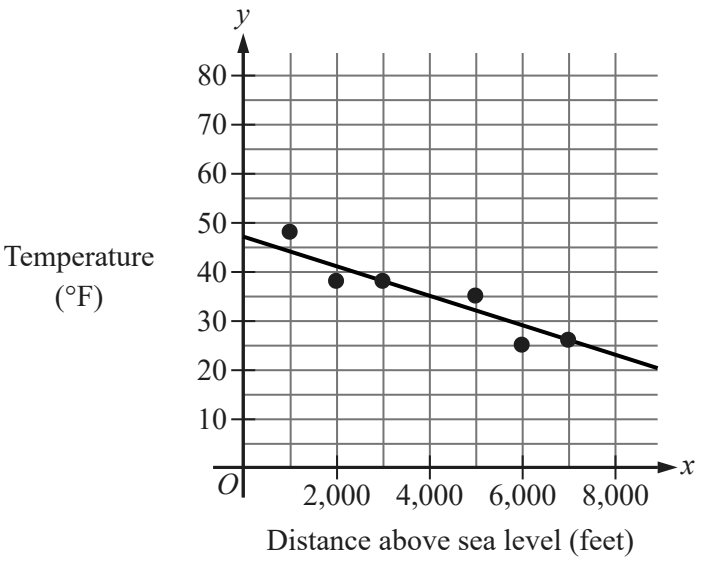
Question Difficulty: Easy

Question ID 3349bc95

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	Easy

ID: 3349bc95

The scatterplot shows the temperature, in degrees Fahrenheit ($^\circ$F), and the distance above sea level, in feet, measured at 6 locations on Mount Jefferson. A line of best fit is also shown.



At a distance of $4{,}000$ feet above sea level, what is the temperature, in $^\circ$F, predicted by the line of best fit?

A. 47

B. 35

C. 25

D. 0

ID: 3349bc95 Answer

Correct Answer: B

Rationale

Choice B is correct. In the given scatterplot, the x-values represent the distance above sea level, in feet, and the y-values represent the temperature, in $^\circ$F. The point on the line of best fit with an x-value of $4{,}000$ has a corresponding y-value of 35. Therefore, at a distance of $4{,}000$ feet above sea level, the temperature predicted by the line of best fit is $35\,^\circ$F.

Choice A is incorrect. This is the temperature, in $^\circ$F, predicted by the line of best fit at a distance of 0 feet above sea level.

Choice C is incorrect. This is the measured temperature, in $^\circ$F, at a distance of $6{,}000$ feet above sea level.

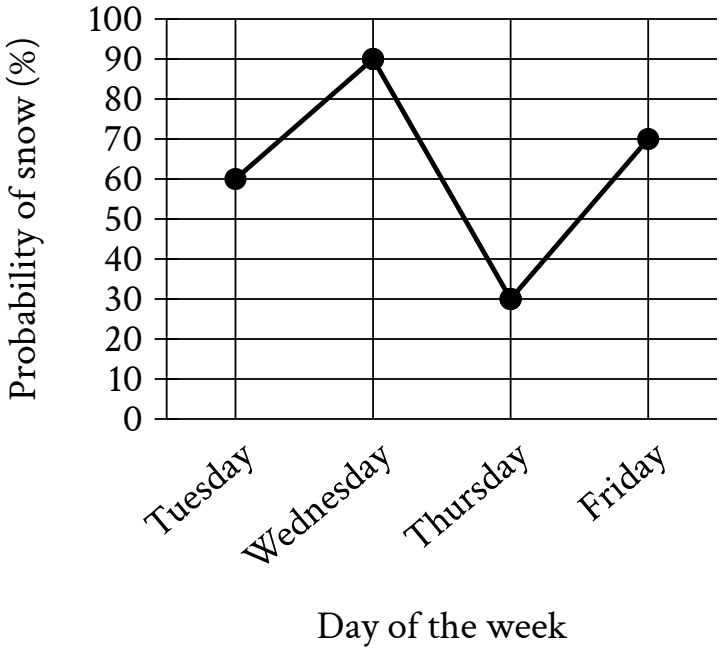
Choice D is incorrect and may result from conceptual or calculation errors.

Question Difficulty: Easy

Question ID 9a3472d0

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	Easy

ID: 9a3472d0



The line graph shows the probability of snow, as a percent, at a certain location for each day during a four-day period. According to the line graph, for which day during this four-day period is the probability of snow 30%?

A. Tuesday

B. Wednesday

C. Thursday

D. Friday

ID: 9a3472d0 Answer

Correct Answer: C

Rationale

Choice C is correct. For the line graph shown, the probability of snow, as a percent, is represented on the vertical axis. According to the line graph, during this four-day period, the probability of snow is 30% for Thursday.

Choice A is incorrect. The probability of snow on Tuesday is 60%.

Choice B is incorrect. The probability of snow on Wednesday is 90%.

Choice D is incorrect. The probability of snow on Friday is 70%.

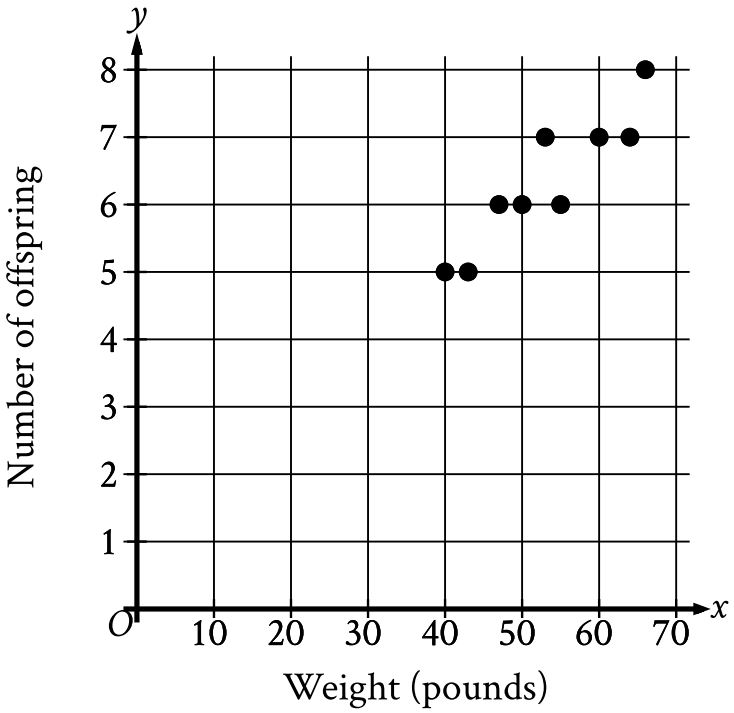
Question Difficulty: Easy

Question ID 426d1e38

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	Easy

ID: 426d1e38

The scatterplot shows the relationship between the weight, in pounds, of each of 9 female gray wolves on April 30 and the number of offspring each gray wolf produced.



How many offspring did the 50-pound gray wolf produce?

A. 8

B. 7

C. 6

D. 5

ID: 426d1e38 Answer

Correct Answer: C

Rationale

Choice C is correct. For each point on the scatterplot shown, the *x*-value represents the weight, in pounds, of a female gray wolf and the *y*-value represents the number of offspring that wolf produced. The point on the graph with an *x*-value of 50 has a *y*-value of 6. Therefore, the 50-pound gray wolf produced 6 offspring.

Choice A is incorrect. One of the wolves produced 8 offspring, but its weight was greater than 50 pounds.

Choice B is incorrect. Three of the wolves produced 7 offspring each, but their weights were each greater than 50 pounds.

Choice D is incorrect. Two of the wolves produced 5 offspring each, but their weights were each less than 50 pounds.

Question Difficulty: Easy

Question ID ddb43390

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	Easy

ID: ddb43390

The table shows selected values from function f.

x	$f(x)$
-1	16
0	17
1	18
2	19

Which of the following is the best description of function f?

A. Decreasing linear

B. Increasing linear

C. Decreasing exponential

D. Increasing exponential

ID: ddb43390 Answer

Correct Answer: B

Rationale

Choice B is correct. The given values show that as x increases, $f(x)$ also increases, which means that f is an increasing function. Furthermore, $f(x)$ increases at a constant rate of 1 for each increase of x by 1. A function with a constant rate of change is linear. Thus, the function f can be described as an increasing linear function.

Choice A is incorrect. For a decreasing linear function, as x increases, $f(x)$ decreases rather than increases.

Choice C is incorrect. For a decreasing exponential function, for each increase of x by 1, $f(x)$ decreases by a fixed percentage rather than increases at a constant rate.

Choice D is incorrect. For an increasing exponential function, for each increase of x by 1, $f(x)$ increases by a fixed percentage rather than at a constant rate.

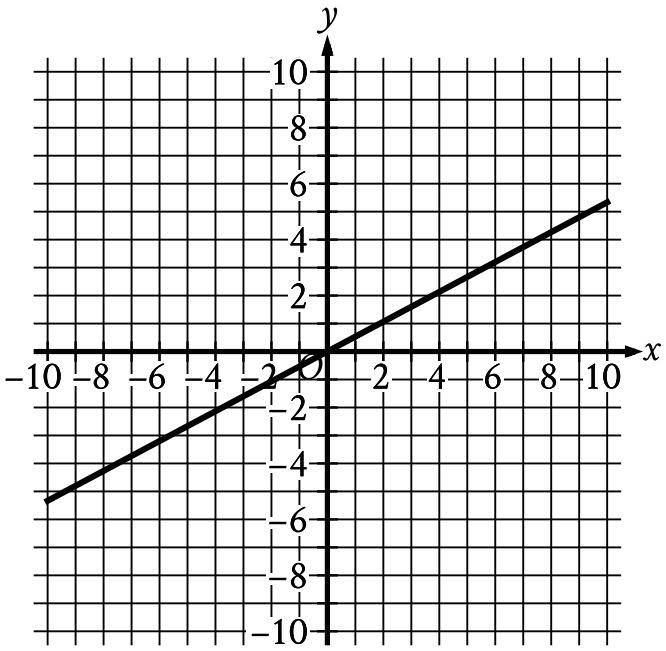
Question Difficulty: Easy

Question ID 0449a9d0

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	Easy

ID: 0449a9d0

The graph of function f is shown, where $y = f(x)$.



Which of the following describes function f?

A. Increasing linear

B. Decreasing linear

C. Increasing exponential

D. Decreasing exponential

ID: 0449a9d0 Answer

Correct Answer: A

Rationale

Choice A is correct. The graph of function f shows that as x increases, $f(x)$ also increases, which means $f(x)$ is an increasing function. The graph of f is a line, which indicates a constant rate of change. A function that has a constant rate of change is a linear function. Therefore, function f can be described as increasing linear.

Choice B is incorrect. For a decreasing function, as x increases, $f(x)$ decreases, rather than increases.

Choice C is incorrect. For a decreasing function, as x increases, $f(x)$ decreases, rather than increases, and the graph of an exponential function isn't a line.

Choice D is incorrect. The graph of an exponential function isn't a line.

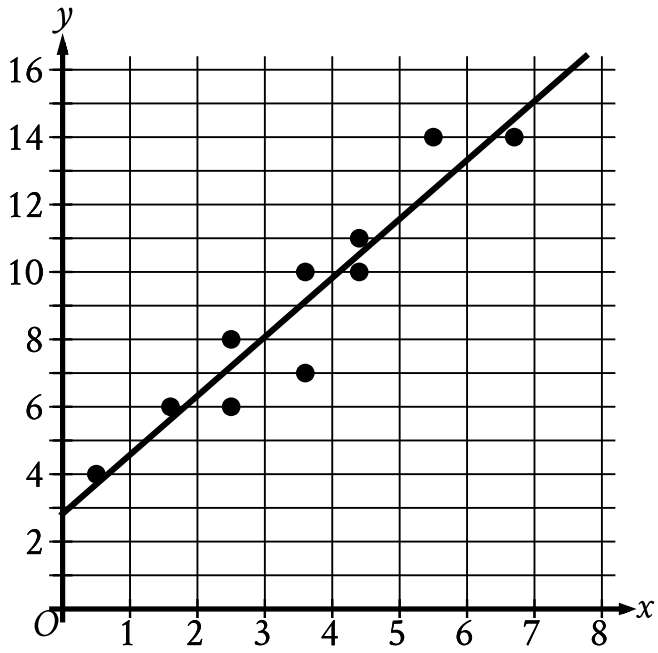
Question Difficulty: Easy

Question ID ce544c96

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	Easy

ID: ce544c96

The scatterplot shows the relationship between two variables, x and y. A line of best fit is also shown.



Which of the following equations best represents the line of best fit shown?

A. $y = 2.8 + 1.7x$

B. $y = 2.8 - 1.7x$

C. $y = -2.8 + 1.7x$

D. $y = -2.8 - 1.7x$

ID: ce544c96 Answer

Correct Answer: A

Rationale

Choice A is correct. The line of best fit shown intersects the *y*-axis at a positive *y*-value and has a positive slope. The graph of an equation of the form $y = a + bx$, where a and b are constants, intersects the *y*-axis at a *y*-value of a and has a slope of b. Of the given choices, only choice A represents a line that intersects the *y*-axis at a positive *y*-value, 2.8, and has a positive slope, 1.7.

Choice B is incorrect. This equation represents a line that has a negative slope, not a positive slope.

Choice C is incorrect. This equation represents a line that intersects the *y*-axis at a negative *y*-value, not a positive *y*-value.

Choice D is incorrect. This equation represents a line that intersects the *y*-axis at a negative *y*-value, not a positive *y*-value, and has a negative slope, not a positive slope.

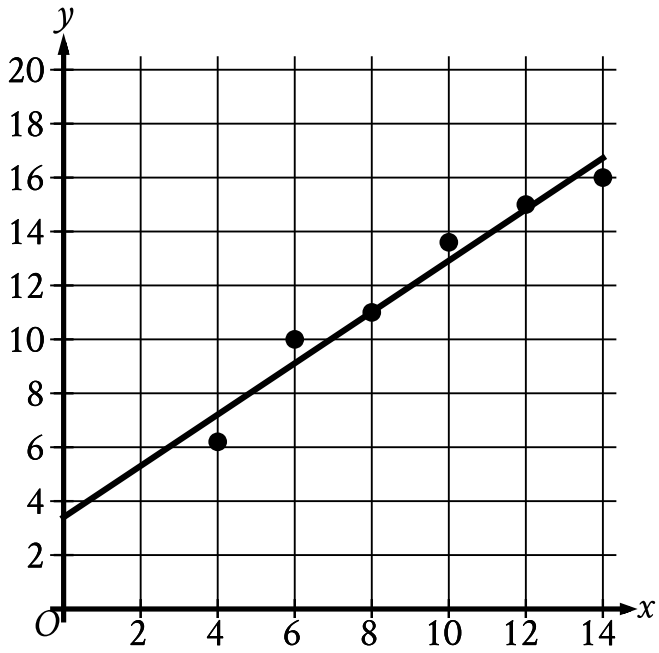
Question Difficulty: Easy

Question ID b2b843b0

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	Easy

ID: b2b843b0

The scatterplot shows the relationship between two variables, x and y. A line of best fit is also shown.



Which of the following equations best represents the line of best fit shown?

A. $y = x + 3.4$

B. $y = x - 3.4$

C. $y = -x + 3.4$

D. $y = -x - 3.4$

ID: b2b843b0 Answer

Correct Answer: A

Rationale

Choice A is correct. The line of best fit shown has a positive slope and intersects the *y*-axis at a positive *y*-value. The graph of an equation of the form $y = mx + b$, where m and b are constants, has a slope of m and intersects the *y*-axis at a *y*-value of b. Of the given choices, only $y = x + 3.4$ represents a line that has a positive slope, 1, and intersects the *y*-axis at a positive *y*-value, 3.4.

Choice B is incorrect. This equation represents a line that intersects the *y*-axis at a negative *y*-value, not a positive *y*-value.

Choice C is incorrect. This equation represents a line that has a negative slope, not a positive slope.

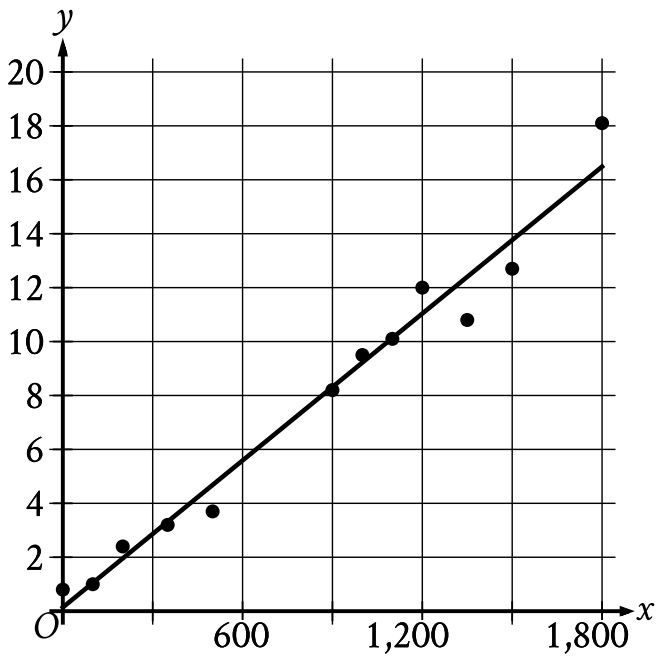
Choice D is incorrect. This equation represents a line that has a negative slope, not a positive slope, and intersects the *y*-axis at a negative *y*-value, not a positive *y*-value.

Question Difficulty: Easy

Question ID 9073e2c4

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	Easy

ID: 9073e2c4



Twelve data points are shown in the scatterplot. A line of best fit for the data is also shown. At $x = 1{,}200$, which of the following is closest to the *y*-value predicted by the line of best fit?

A. 16

B. 14

C. 11

D. 6

ID: 9073e2c4 Answer

Correct Answer: C

Rationale

Choice C is correct. On the line of best fit, an *x*-value of $1{,}200$ corresponds to a *y*-value between 10 and 12. Therefore, of the given choices, 11 is closest to the *y*-value predicted by the line of best fit at $x = 1{,}200$.

Choice A is incorrect. This is the integer value closest to the *y*-value predicted by the line of best fit at $x = 1{,}800$.

Choice B is incorrect. This is the integer value closest to the *y*-value predicted by the line of best fit at $x = 1{,}500$.

Choice D is incorrect. This is the integer value closest to the *y*-value predicted by the line of best fit at $x = 600$.

Question Difficulty: Easy

Question ID 44c4426d

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	Easy

ID: 44c4426d

An airplane descends from an altitude of $9{,}500$ feet to $5{,}000$ feet at a constant rate of 400 feet per minute. What type of function best models the relationship between the descending airplane's altitude and time?

A. Decreasing exponential

B. Decreasing linear

C. Increasing exponential

D. Increasing linear

ID: 44c4426d Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that the airplane descends at a constant rate of $400\ \text{feet per minute}$. Since the altitude decreases by a constant amount during each fixed time period, the relationship between the airplane's altitude and time is linear. Since the airplane descends from an altitude of $9{,}500\ \text{feet}$ to $5{,}000\ \text{feet}$, the airplane's altitude is decreasing with time. Thus, the relationship is best modeled by a decreasing linear function.

Choice A is incorrect and may result from conceptual or calculation errors.

Choice C is incorrect and may result from conceptual or calculation errors.

Choice D is incorrect and may result from conceptual or calculation errors.

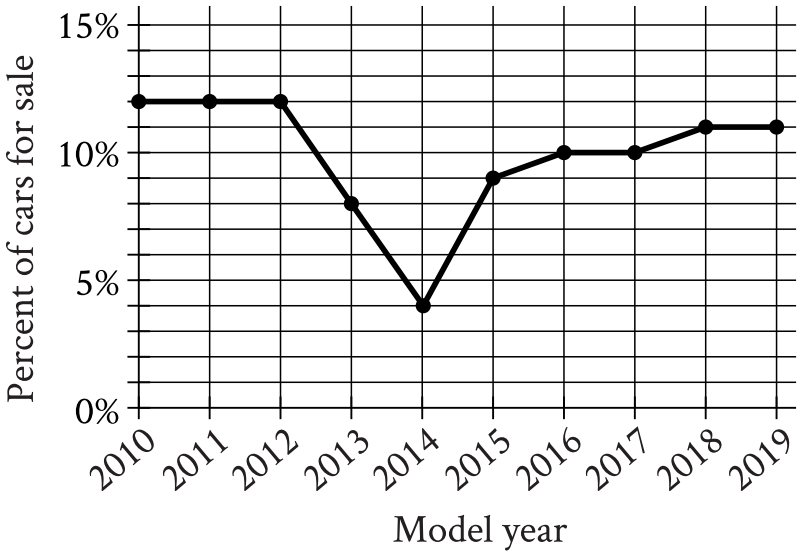
Question Difficulty: Easy

Question ID bcae826d

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	Easy

ID: bcae826d

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

ID: bcae826d Answer

Correct Answer: C

Rationale

Choice C is correct. For the given line graph, the percent of cars for sale at a used car lot on a given day is represented on the vertical axis. The percent of cars for sale is the smallest when the height of the line graph is the lowest. The lowest height of the line graph occurs for cars with a model year of 2014.

Choice A is incorrect and may result from conceptual errors.

Choice B is incorrect and may result from conceptual errors.

Choice D is incorrect and may result from conceptual errors.

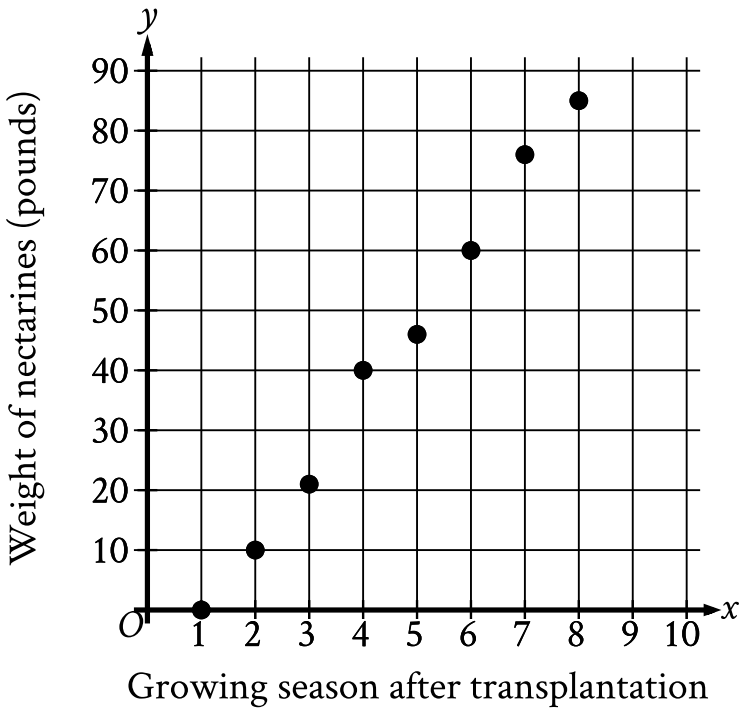
Question Difficulty: Easy

Question ID 9a8df0e2

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	Easy

ID: 9a8df0e2

An orchard owner recorded the weight, in pounds, of all nectarines that grew on a dwarf nectarine tree during each growing season after the tree's transplantation. The scatterplot shows this weight, in pounds, for each growing season after the tree's transplantation.



What was the weight, to the nearest pound, of all nectarines that grew on the tree during the 4th growing season after the tree's transplantation?

ID: 9a8df0e2 Answer

Correct Answer: 40

Rationale

The correct answer is 40. For each data point on the scatterplot, the *x*-value represents the growing season after transplantation and the *y*-value represents the weight, in pounds, of all nectarines that grew on the tree during the season. The scatterplot shows a data point at $(4, 40)$. It follows that during the 4th growing season after the tree's transplantation, 40 pounds of nectarines grew on the tree.

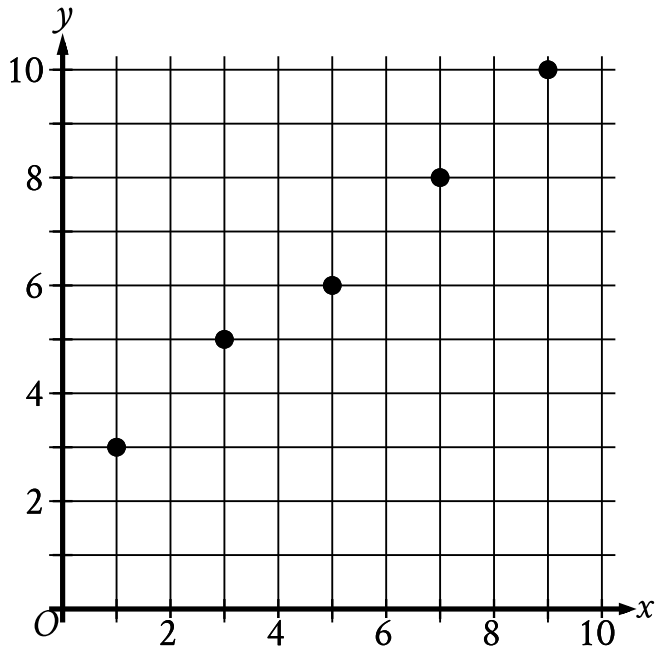
Question Difficulty: Easy

Question ID 57045eee

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	Easy

ID: 57045eee

The scatterplot shows the relationship between two variables, x and y.



Which equation is the most appropriate linear model for this relationship?

A. $y = -0.9x - 2.2$

B. $y = -0.9x + 2.2$

C. $y = -0.9x$

D. $y = 0.9x + 2.2$

ID: 57045eee Answer

Correct Answer: D

Rationale

Choice D is correct. A linear model can be written in the form $y = mx + b$, where m is the slope of the graph of the model in the *xy*-plane and $(0, b)$ is the *y*-intercept. The graph of an appropriate linear model for this relationship passes near the points $(1, 3)$ and $(9, 10)$ in the *xy*-plane. Two points on a line, (x_1, y_1) and (x_2, y_2), can be used to find the slope of the line using the slope formula, $m = \frac{y_2 - y_1}{x_2 - x_1}$. Substituting the points $(1, 3)$ and $(9, 10)$ for (x_1, y_1) and (x_2, y_2), respectively, in the slope formula yields $m = \frac{10 - 3}{9 - 1}$, or $m = 0.875$. Therefore, the value of m for an appropriate linear model is

approximately 0.875. Substituting 0.875 for m in $y = mx + b$ yields $y = 0.875x + b$. Since an appropriate linear model passes near the point $(1, 3)$, the approximate value of b can be found by substituting 1 for x and 3 for y in the equation $y = 0.875x + b$, which yields $3 = (0.875)(1) + b$, or $3 = 0.875 + b$. Subtracting 0.875 from both sides of this equation yields $2.125 = b$. Therefore, the value of b for an appropriate linear model is approximately 2.125. Thus, of the given choices, $y = 0.9x + 2.2$ is the most appropriate linear model for this relationship.

Alternate approach: A linear model can be written in the form $y = mx + b$, where m is the slope of the graph of the model in the *xy*-plane and $(0, b)$ is the *y*-intercept. The scatterplot shows that as the *x*-values of the data points increase, the *y*-values of the data points increase, which means the graph of an appropriate linear model has a positive slope. Of the given choices, $y = 0.9x + 2.2$ is the only linear model whose graph has a positive slope.

Choice A is incorrect. The graph of this model has a negative slope, not a positive slope.

Choice B is incorrect. The graph of this model has a negative slope, not a positive slope.

Choice C is incorrect. The graph of this model has a negative slope, not a positive slope.

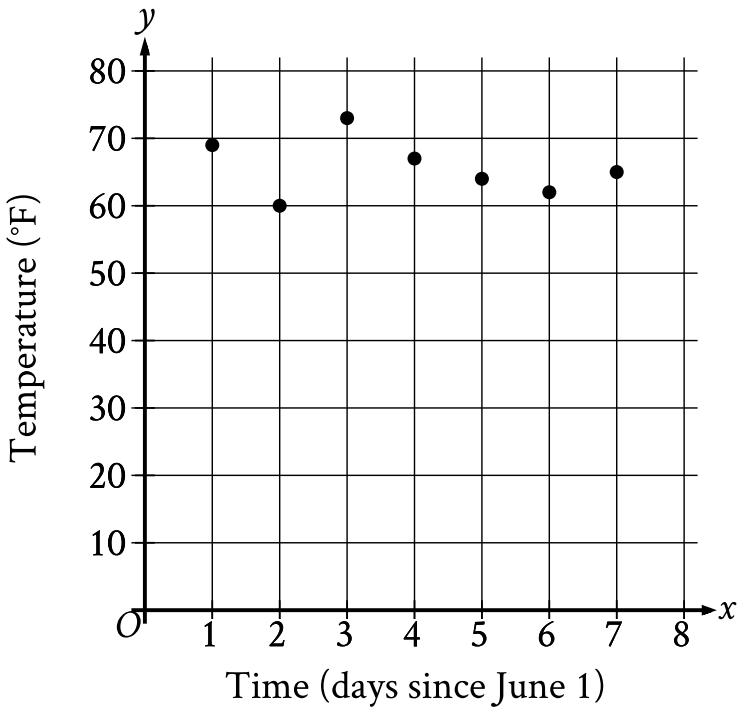
Question Difficulty: Easy

Question ID 6a23e77a

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	Easy

ID: 6a23e77a

The scatterplot shows the temperature y, in $^\circ\mathrm{F}$, recorded by a meteorologist at various times x, in days since June 1.



During which of the following time periods did the greatest increase in recorded temperature take place?

A. From $x = 6$ to $x = 7$

B. From $x = 5$ to $x = 6$

C. From $x = 2$ to $x = 3$

D. From $x = 1$ to $x = 2$

ID: 6a23e77a Answer

Correct Answer: C

Rationale

Choice C is correct. The scatterplot shows that there was an increase in recorded temperature from $x = 2$ to $x = 3$ and from $x = 6$ to $x = 7$. When $x = 2$, the recorded temperature was approximately $60^\circ\mathrm{F}$ and when $x = 3$, the recorded temperature was greater than $70^\circ\mathrm{F}$. This means that the increase in recorded temperature from $x = 2$ to $x = 3$ was greater than $(70 - 60)^\circ\mathrm{F}$, or $10^\circ\mathrm{F}$. When $x = 6$, the recorded temperature was greater than $60^\circ\mathrm{F}$ and when $x = 7$, the

recorded temperature was less than 70°F. This means that the increase in recorded temperature from $x = 6$ to $x = 7$ was less than $(70 - 60)^\circ\text{F}$, or 10°F. It follows that the greatest increase in recorded temperature took place from $x = 2$ to $x = 3$.

Choice A is incorrect. The increase in recorded temperature from $x = 6$ to $x = 7$ was less than the increase in recorded temperature from $x = 2$ to $x = 3$.

Choice B is incorrect. From $x = 5$ to $x = 6$, a decrease, not an increase, in recorded temperature took place.

Choice D is incorrect. From $x = 1$ to $x = 2$, a decrease, not an increase, in recorded temperature took place.

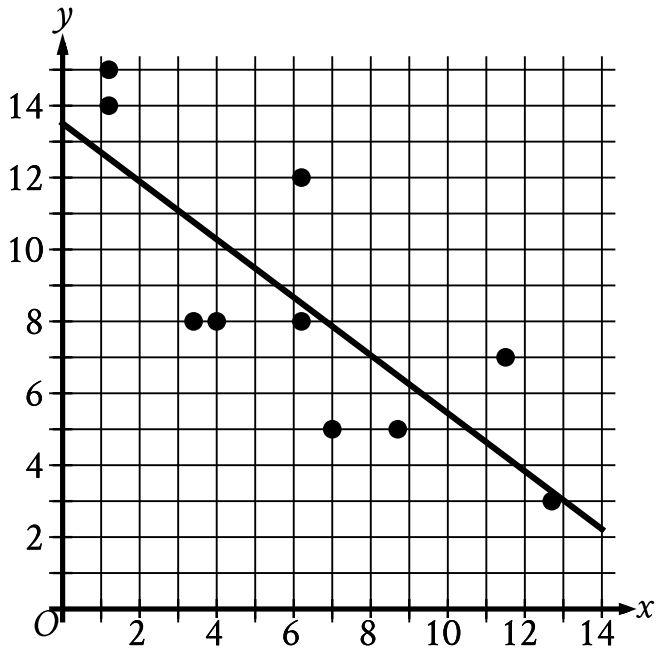
Question Difficulty: Easy

Question ID bce16aa4

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	Easy

ID: bce16aa4

The scatterplot shows the relationship between two variables, x and y. A line of best fit is also shown.



Which of the following equations best represents the line of best fit shown?

A. $y = 13.5 + 0.8x$

B. $y = 13.5 - 0.8x$

C. $y = -13.5 + 0.8x$

D. $y = -13.5 - 0.8x$

ID: bce16aa4 Answer

Correct Answer: B

Rationale

Choice B is correct. The line of best fit shown intersects the *y*-axis at a positive *y*-value and has a negative slope. The graph of an equation of the form $y = a + bx$, where a and b are constants, intersects the *y*-axis at a *y*-value of a and has a slope of b. Of the given choices, only choice B represents a line that intersects the *y*-axis at a positive *y*-value, 13.5, and has a negative slope, -0.8.

Choice A is incorrect. This equation represents a line that has a positive slope, not a negative slope.

Choice C is incorrect. This equation represents a line that intersects the *y*-axis at a negative *y*-value, not a positive *y*-value, and has a positive slope, not a negative slope.

Choice D is incorrect. This equation represents a line that intersects the *y*-axis at a negative *y*-value, not a positive *y*-value.

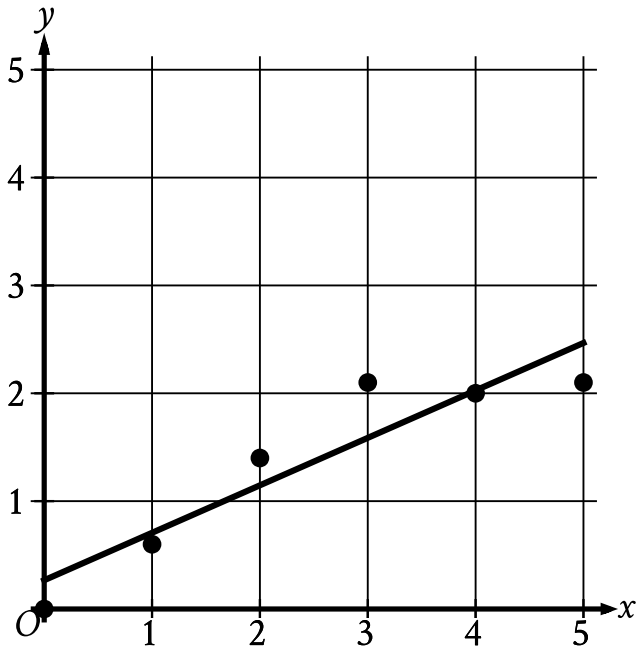
Question Difficulty: Easy

Question ID b018fdc5

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	Easy

ID: b018fdc5

The scatterplot shows the relationship between x and y. A line of best fit is also shown.



Which of the following is closest to the slope of the line of best fit shown?

A. -2.27

B. -0.44

C. 0.44

D. 2.27

ID: b018fdc5 Answer

Correct Answer: C

Rationale

Choice C is correct. It's given that the scatterplot shows the relationship between two variables, x and y, and a line of best fit is shown. For the line of best fit shown, for each increase in the value of x by 1, the corresponding value of y increases by a constant rate. It follows that the relationship between the variables x and y has a positive linear trend. A line in the *xy*-plane that passes through the points (a, b) and (c, d) has a slope of $\frac{d-b}{c-a}$. The line of best fit shown passes approximately

through the points $(0, 0.25)$ and $(4, 2)$. It follows that the slope of this line is approximately $\frac{2-0.25}{4-0}$, which is equivalent to 0.4375. Therefore, of the given choices, 0.44 is closest to the slope of the line of best fit shown.

Choice A is incorrect. This is the slope of a line of best fit for a relationship between x and y that has a negative, rather than a positive, linear trend.

Choice B is incorrect. This is the slope of a line of best fit for a relationship between x and y that has a negative, rather than a positive, linear trend.

Choice D is incorrect and may result from conceptual or calculation errors.

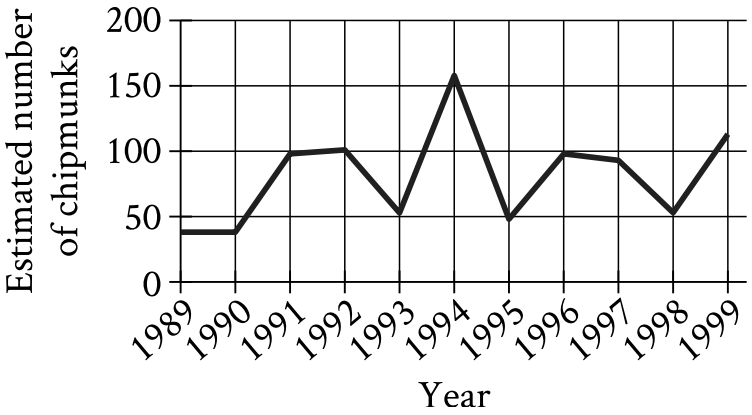
Question Difficulty: Easy

Question ID 31883279

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	Easy

ID: 31883279

The line graph shows the estimated number of chipmunks in a state park on April 1 of each year from 1989 to 1999.



Based on the line graph, in which year was the estimated number of chipmunks in the state park the greatest?

A. 1989

B. 1994

C. 1995

D. 1998

ID: 31883279 Answer

Correct Answer: B

Rationale

Choice B is correct. For the given line graph, the estimated number of chipmunks is represented on the vertical axis. The greatest estimated number of chipmunks in the state park is indicated by the greatest height in the line graph. This height is achieved when the year is 1994.

Choice A is incorrect and may result from conceptual errors.

Choice C is incorrect and may result from conceptual errors.

Choice D is incorrect and may result from conceptual errors.

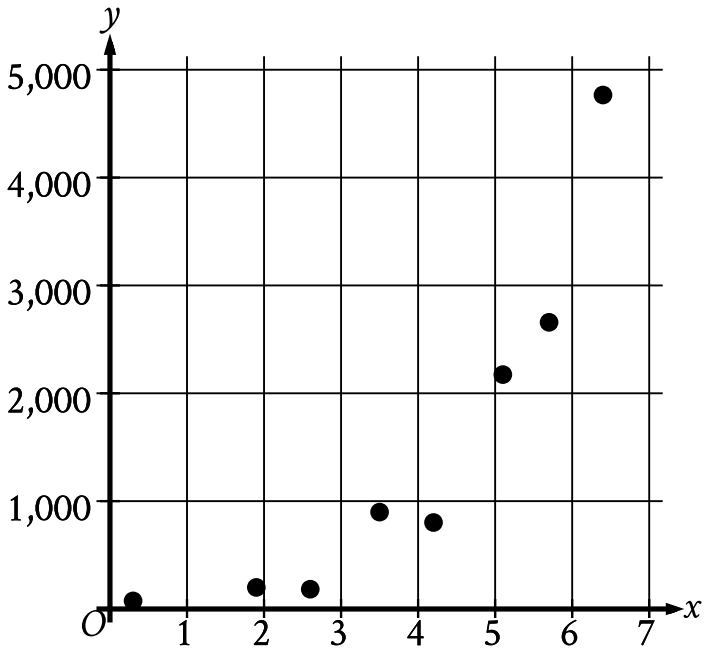
Question Difficulty: Easy

Question ID a7462136

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	Easy

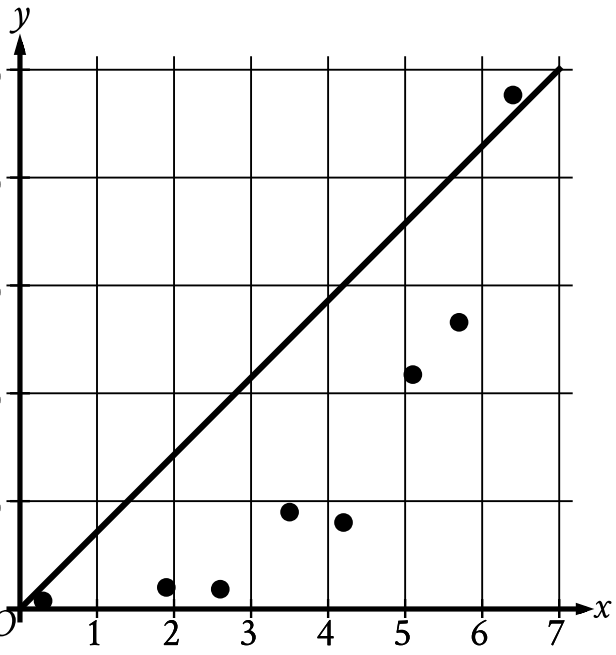
ID: a7462136

The scatterplot shows the relationship between two variables, x and y.

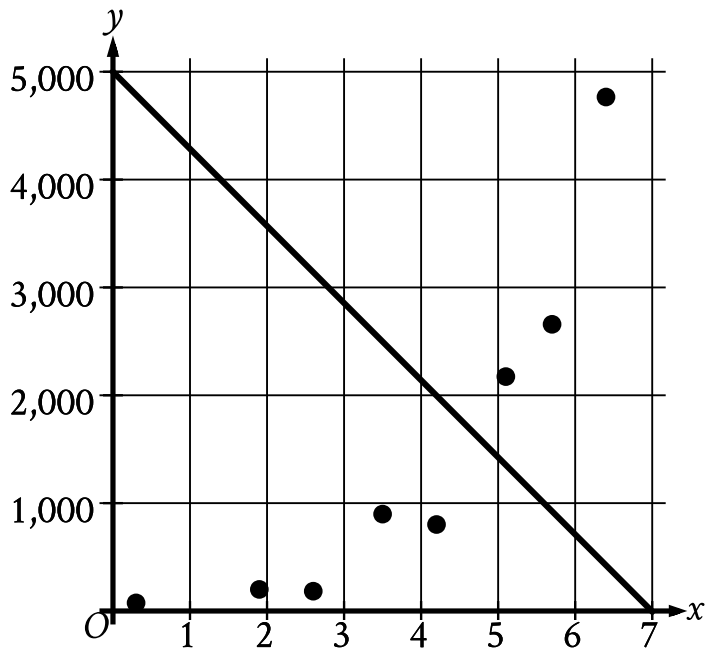


Which of the following graphs shows the most appropriate model for the data?

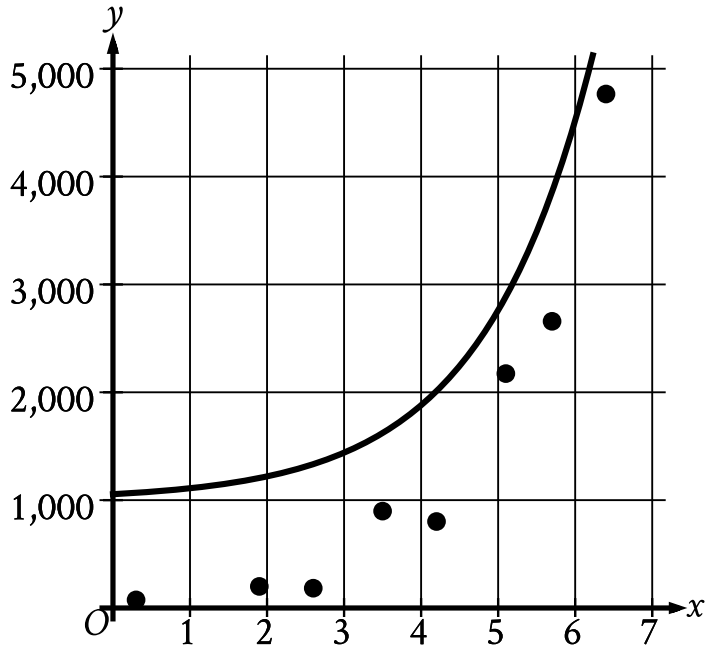
A.



B.


y
5,000
4,000
3,000
2,000
1,000
O
1
2
3
4
5
6
7
x

C.


y
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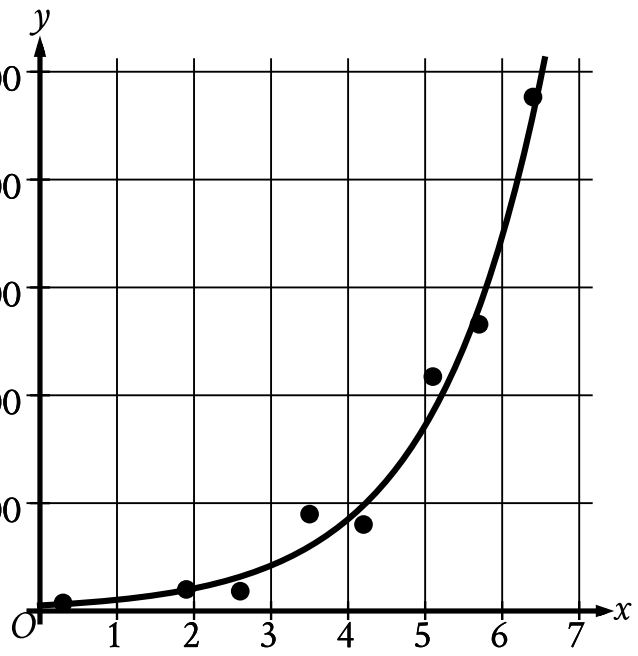
1,000
O
1
2
3
4
5
6
7
x

D.



ID: a7462136 Answer

Correct Answer: D

Rationale

Choice D is correct. An appropriate model should follow the trend of the data points and should have data points both above and below the model. The scatterplot shows that the data points have an increasing trend that is curved. Therefore, an appropriate model should be an increasing curve with data points both above and below the model. Of the given choices, only the model in choice D is an increasing curve with data points both above and below the model.

Choice A is incorrect. Since the trend of the data points isn't linear, a line isn't the most appropriate model for the data.

Choice B is incorrect. Since the trend of the data points is increasing and isn't linear, a decreasing line isn't the most appropriate model for the data.

Choice C is incorrect. All the data points are below the model shown in this graph.

Question Difficulty: Easy