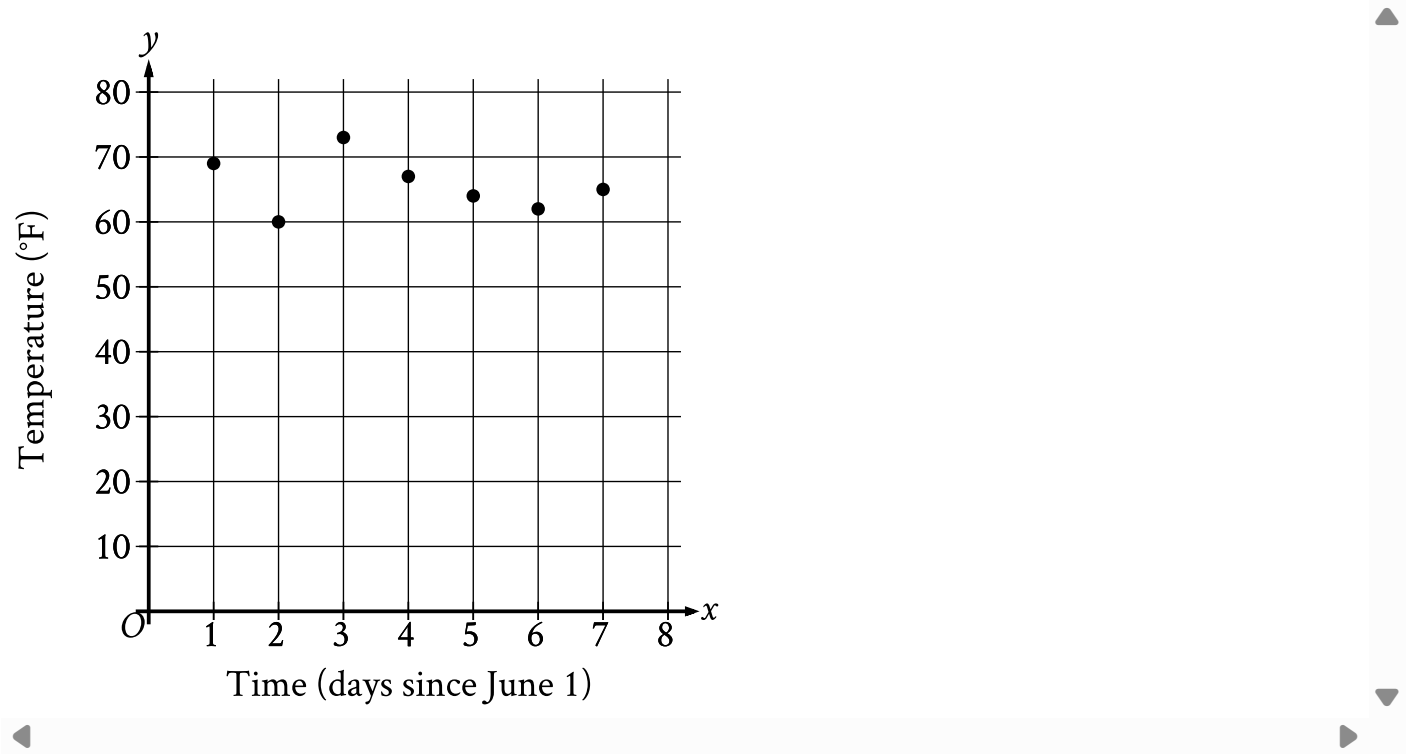


Question ID 134d64f1

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	<div><div></div><div></div><div></div></div>

ID: 134d64f1

The scatterplot shows the temperature y , in $^{\circ}\text{F}$, 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: 134d64f1 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°F and when $x = 3$, the recorded temperature was greater than 70°F . This means that the increase in recorded temperature from $x = 2$ to $x = 3$ was greater than $(70 - 60)^{\circ}\text{F}$, or 10°F . When $x = 6$, the recorded temperature was greater than 60°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.

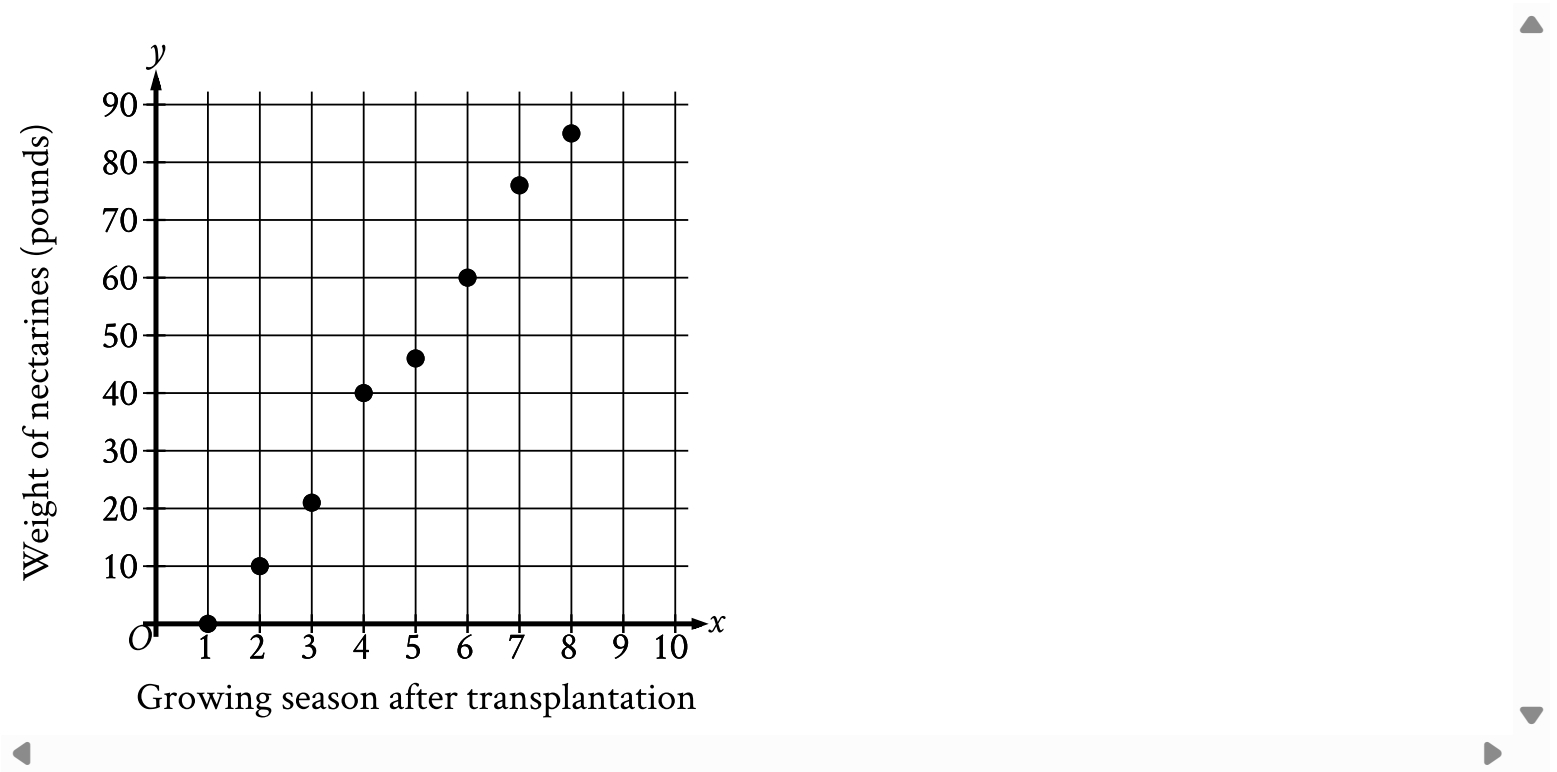
Question Difficulty: Medium

Question ID e5ac5f08

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	<div><div></div><div></div><div></div></div>

ID: e5ac5f08

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: e5ac5f08 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.

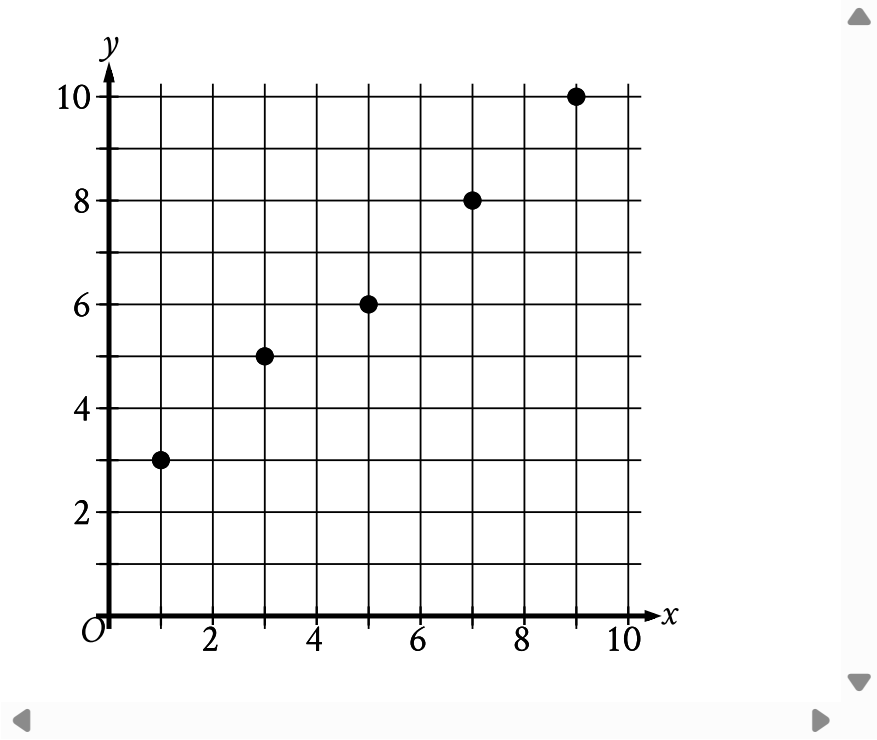
Question Difficulty: Medium

Question ID d729d5f8

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	<div><div></div><div></div><div></div></div>

ID: d729d5f8

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: d729d5f8 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.

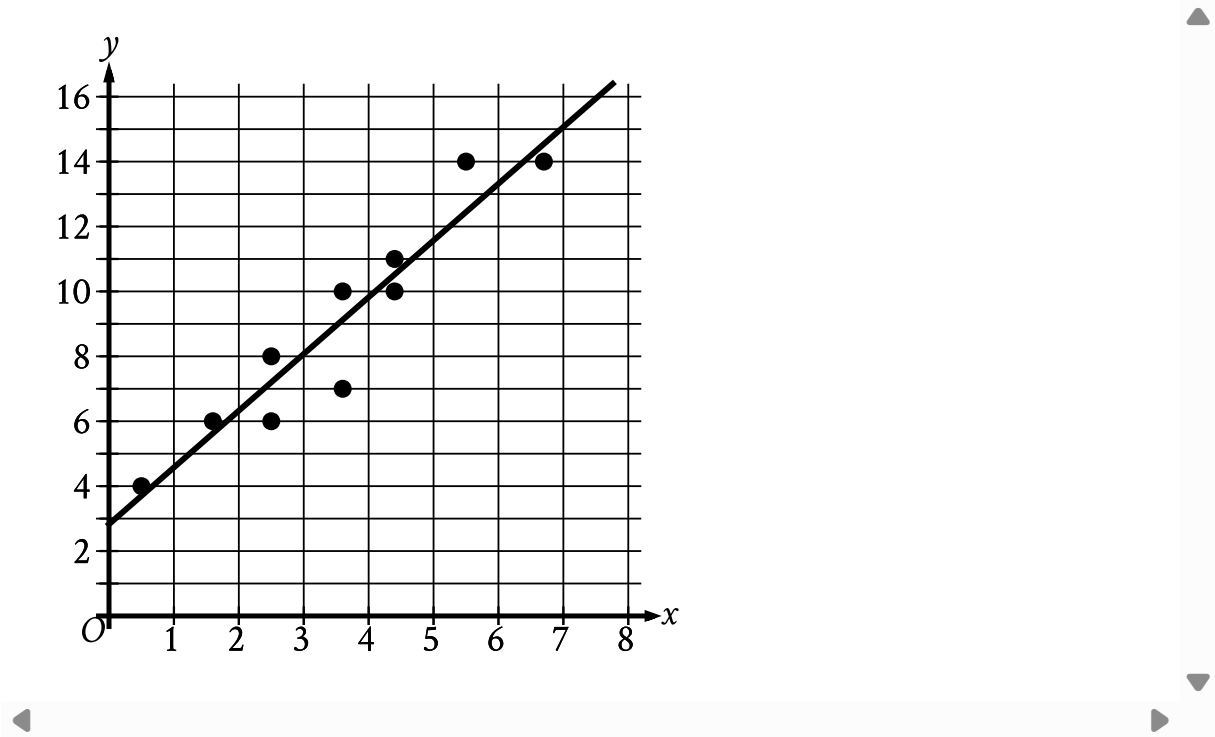
Question Difficulty: Medium

Question ID 1a5628d2

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	<div><div></div><div></div><div></div></div>

ID: 1a5628d2

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: 1a5628d2 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.

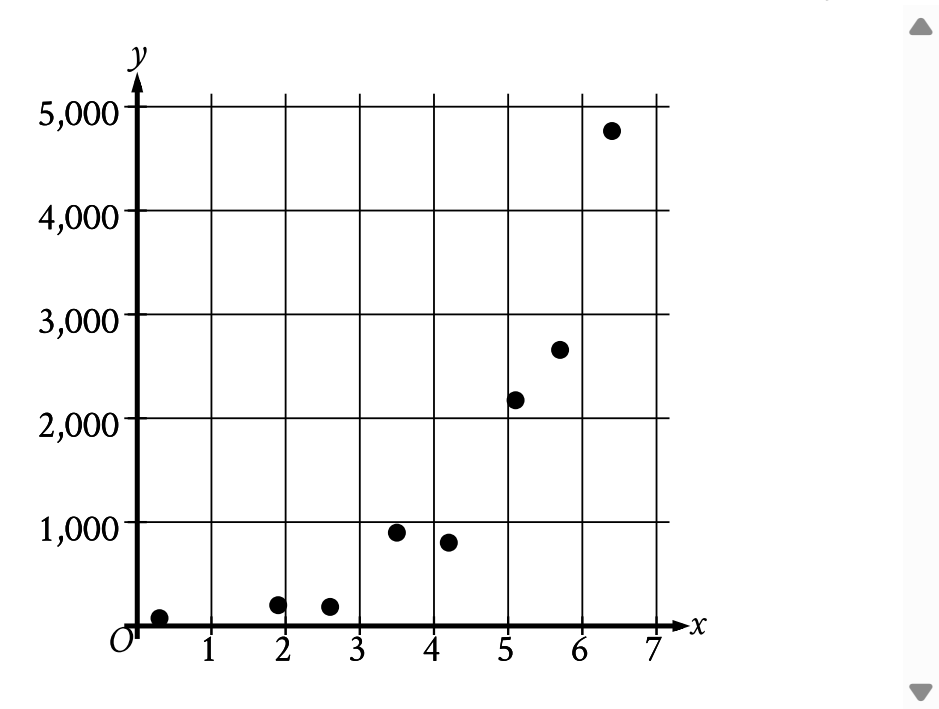
Question Difficulty: Medium

Question ID 69a78012

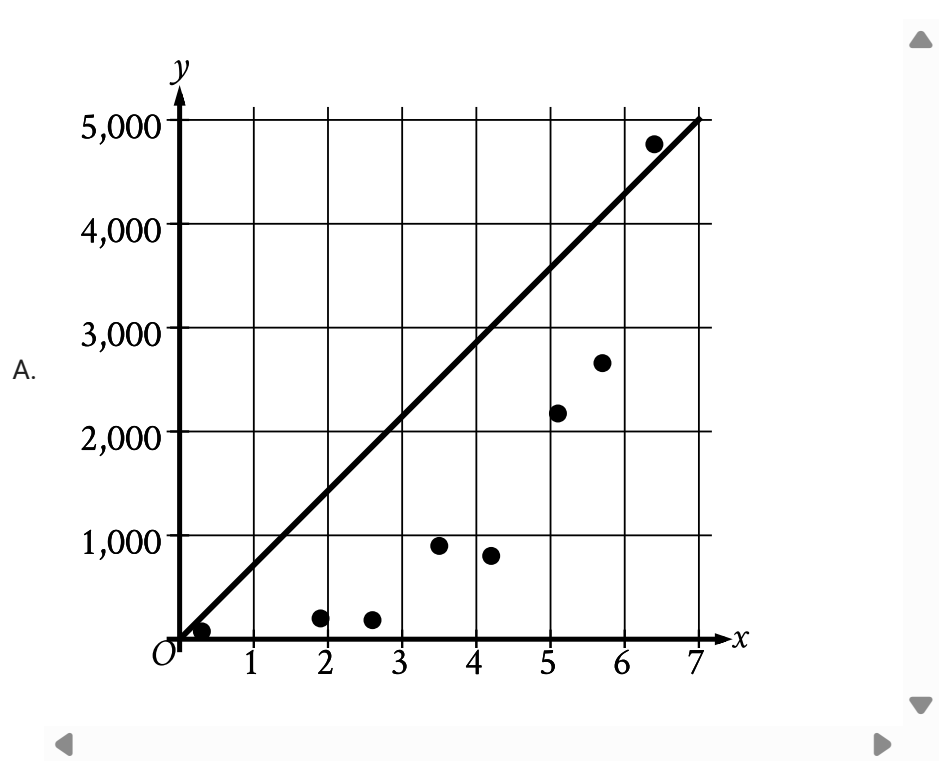
Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	<div><div></div><div></div><div></div></div>

ID: 69a78012

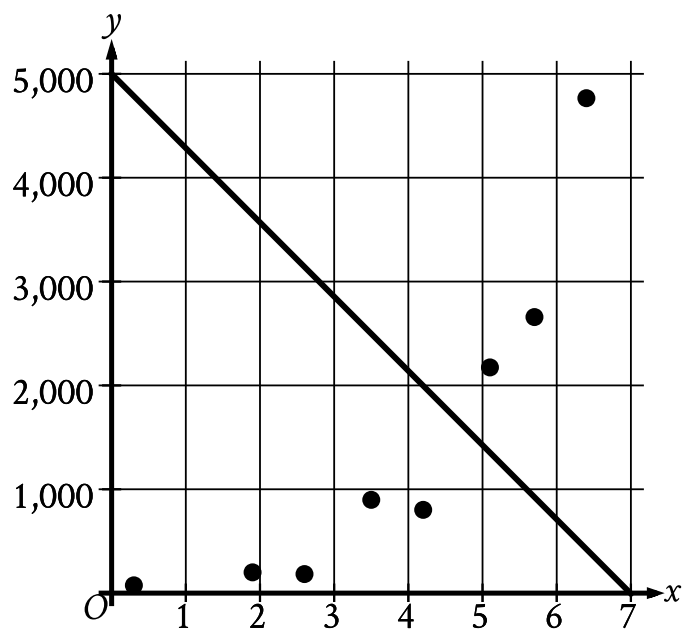
The scatterplot shows the relationship between two variables, x and y .



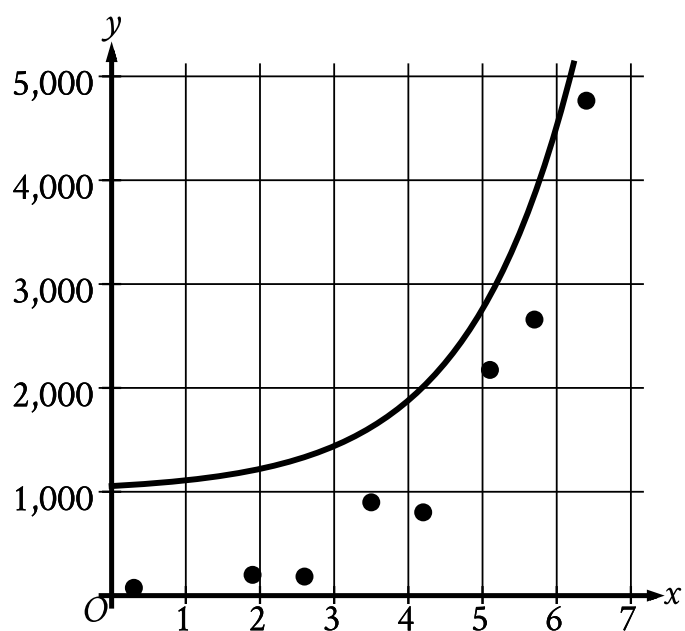
Which of the following graphs shows the most appropriate model for the data?



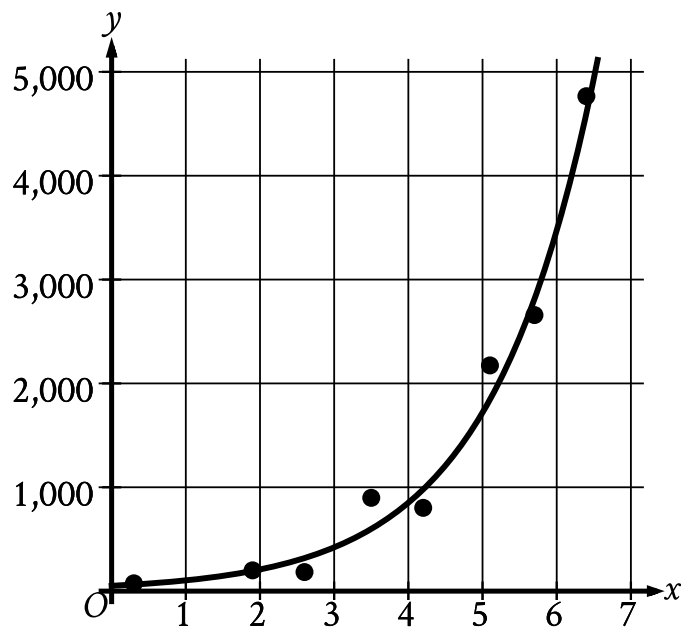
B.



C.



D.



ID: 69a78012 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.

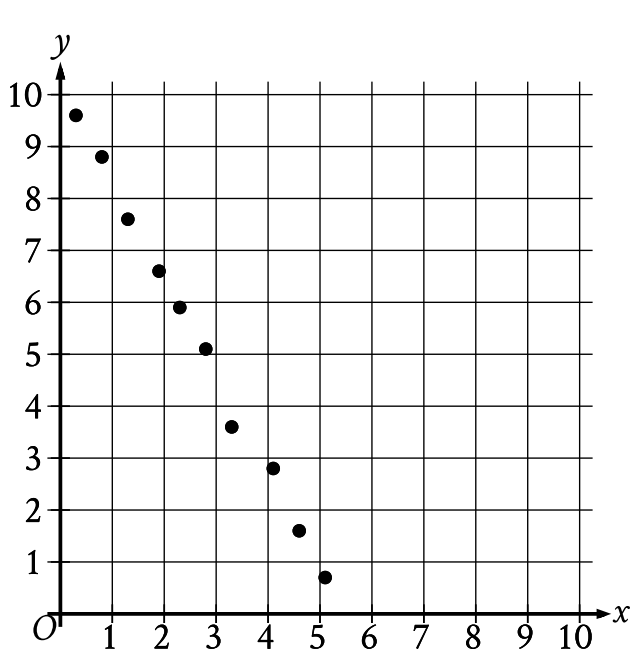
Choice C is incorrect. All the data points are below the model shown in this graph.

Question Difficulty: Medium

Question ID 969cc650

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	<div><div></div><div></div><div></div></div>

ID: 969cc650



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: 969cc650 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 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.

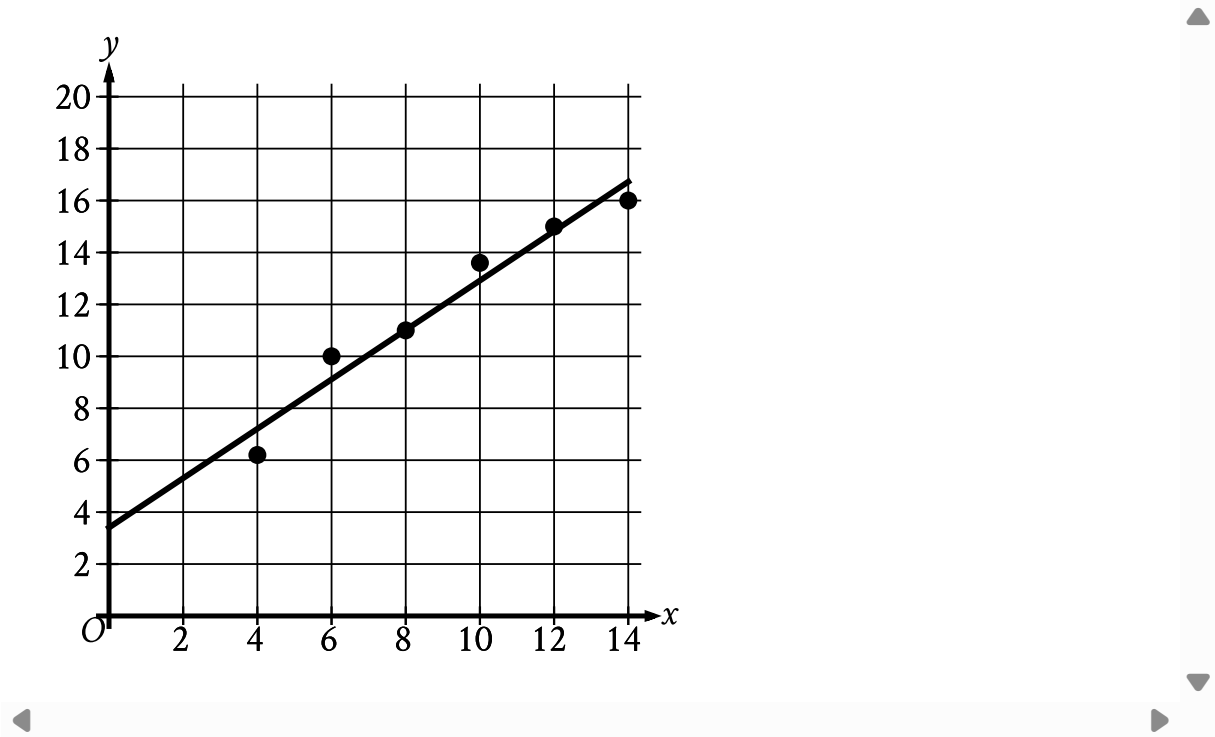
Question Difficulty: Medium

Question ID 4931db0c

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	<div><div></div><div></div><div></div></div>

ID: 4931db0c

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: 4931db0c 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.

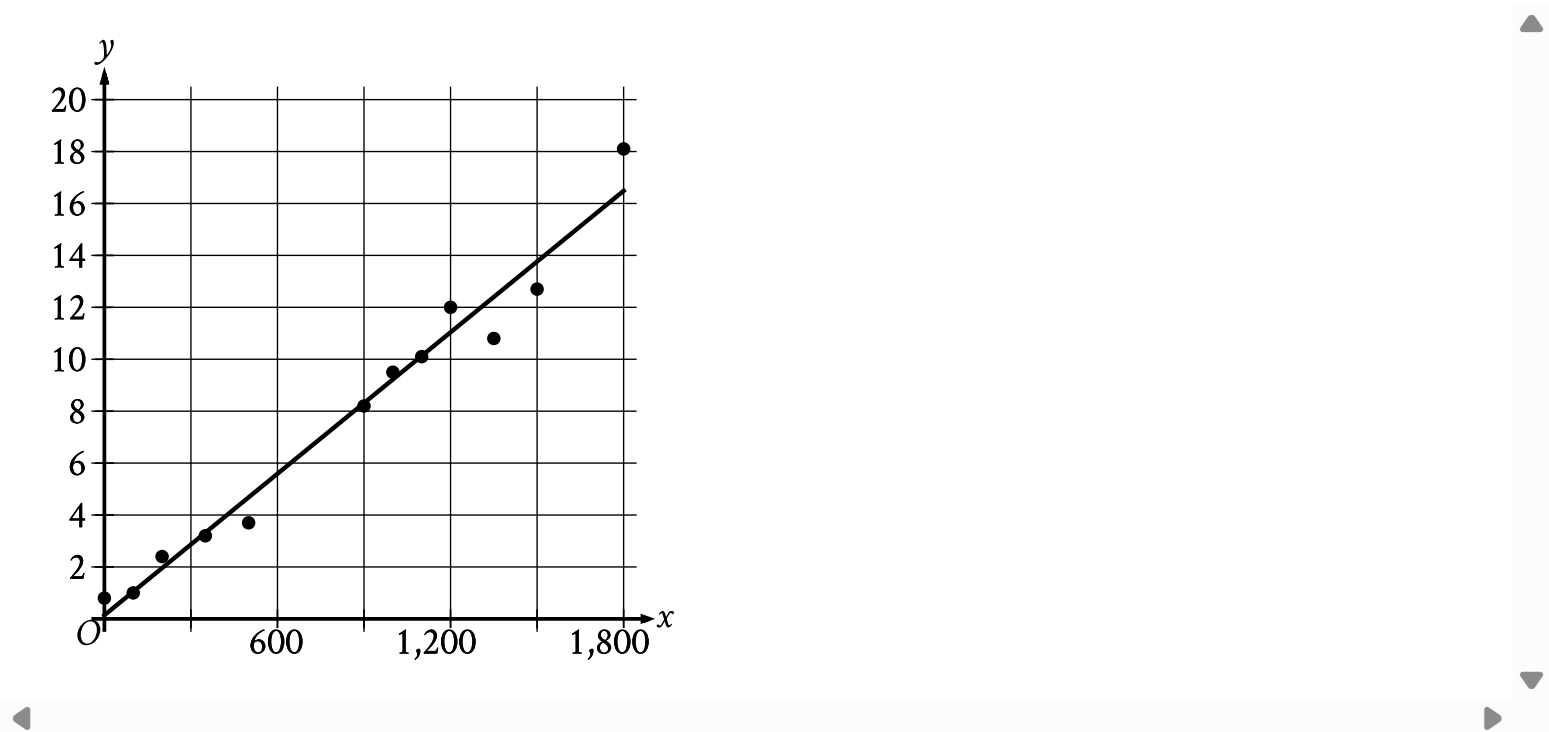
Choice D is incorrect. This equation represents a line that has a negative slope, not a positive slope, and intersects the y -axis at a negative y -value, not a positive y -value.

Question Difficulty: Medium

Question ID 9094c4ae

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	<div><div></div><div></div><div></div></div>

ID: 9094c4ae



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: 9094c4ae 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 $x = 1,500$.

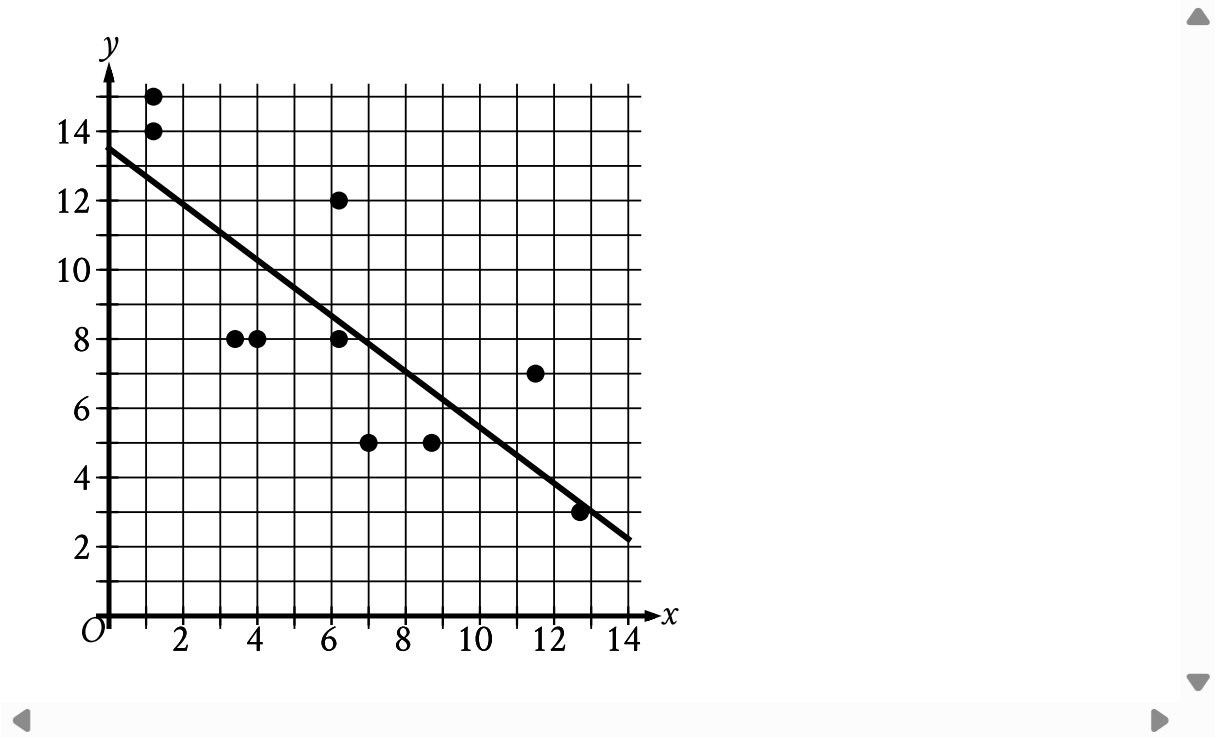
Choice D is incorrect. This is the integer value closest to the y -value predicted by the line of best fit at $x = 600$.

Question ID bffff75

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	<div><div></div><div></div><div></div></div>

ID: bffff75

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: bffff75 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.

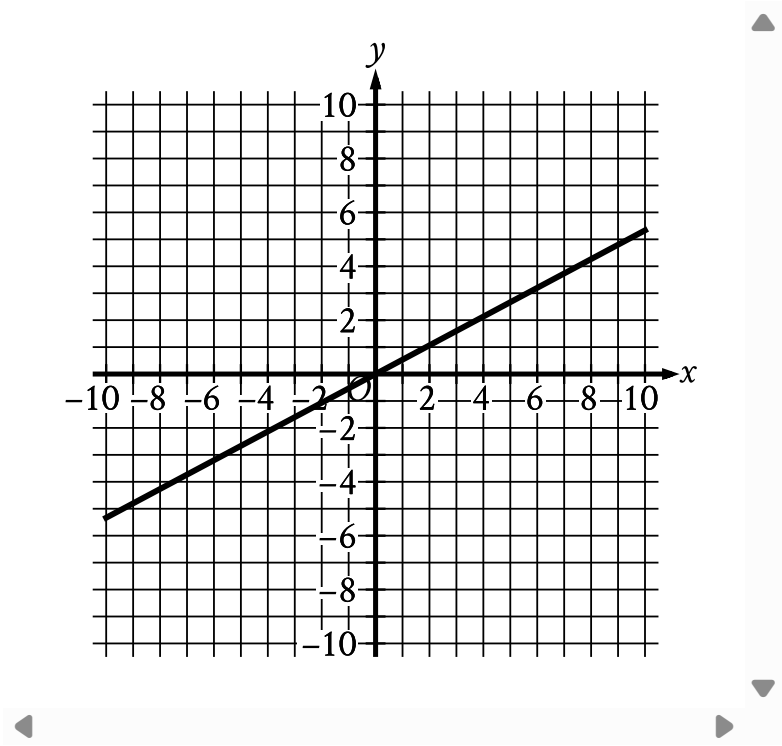
Question Difficulty: Medium

Question ID 7cb5c4dd

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	<div><div></div><div></div><div></div></div>

ID: 7cb5c4dd

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: 7cb5c4dd Answer

Correct Answer: A

Rationale

Choice A is correct. The graph of function f shows that as x increases, fx also increases, which means fx 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, fx decreases, rather than increases.

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

Choice D 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.

Question Difficulty: Medium

Question ID 53eb586e

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	<div><div></div><div></div><div></div></div>

ID: 53eb586e

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: 53eb586e Answer

Correct Answer: B

Rationale

Choice B is correct. The given values show that as x increases, fx also increases, which means that f is an increasing function. Furthermore, fx 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, fx decreases rather than increases.

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

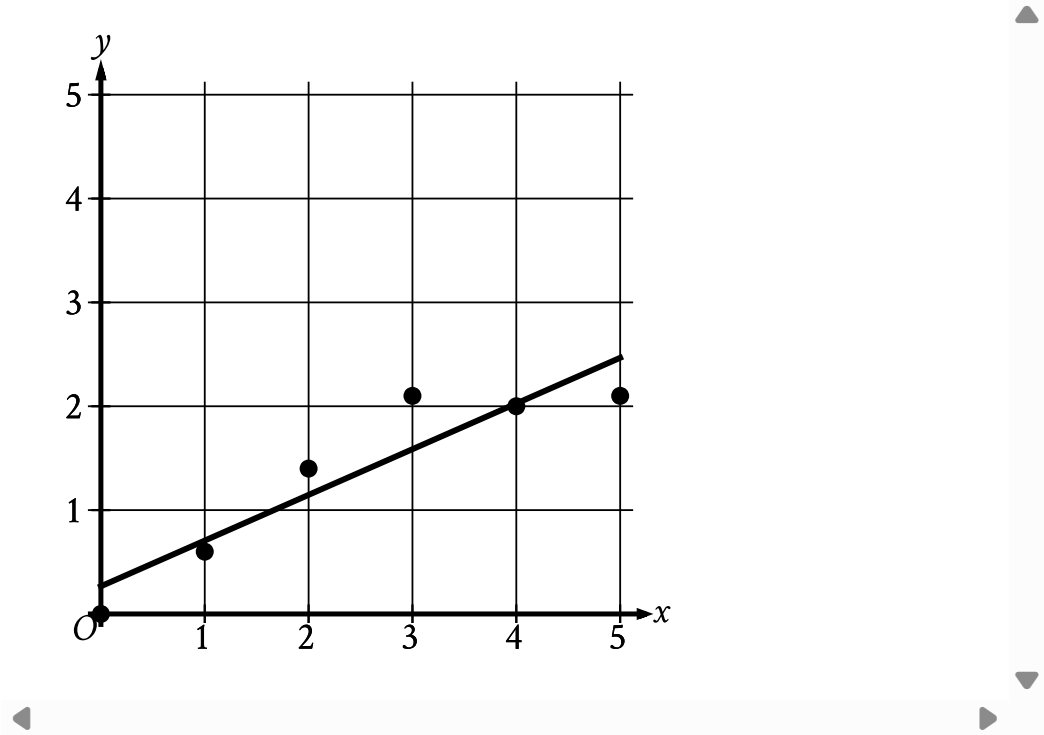
Question Difficulty: Medium

Question ID a8476372

Assessment	Test	Domain	Skill	Difficulty
PSAT 8/9	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	<div><div></div><div></div><div></div></div>

ID: a8476372

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: a8476372 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: Medium