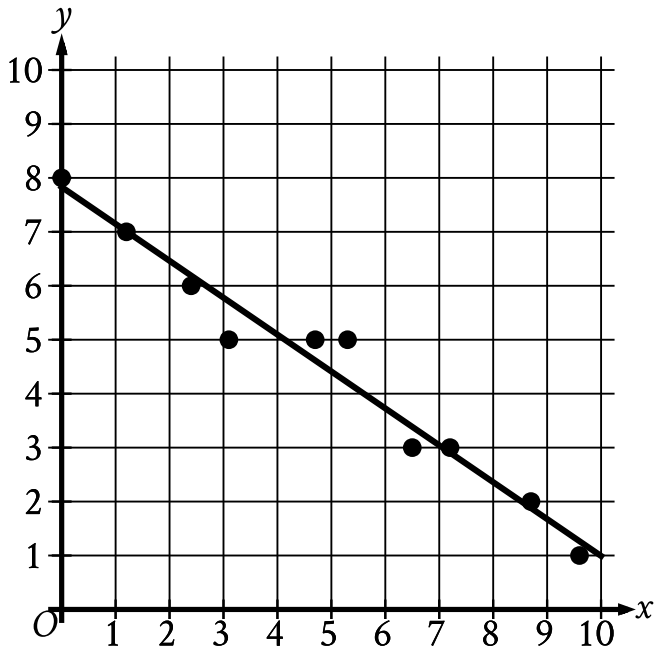
Question ID 796b120b

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

ID: 796b120b

In the given scatterplot, a line of best fit for the data is shown.



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

A. 7

B. 0.7

C. -0.7

D. -7

ID: 796b120b Answer

Correct Answer: C

Rationale

Choice C is correct. A line of best fit is shown in the scatterplot such that as the value of x increases, the value of y decreases. It follows that the slope of the line of best fit shown is negative. The slope of a line in the *xy*-plane that passes through the points (x_1, y_1) and (x_2, y_2) can be calculated as $\frac{y_2-y_1}{x_2-x_1}$. The line of best fit shown passes approximately through the points $(0, 8)$ and $(10, 1)$. Substituting $(0, 8)$ for (x_1, y_1) and $(10, 1)$ for (x_2, y_2) in $\frac{y_2-y_1}{x_2-x_1}$ yields the slope of the line being approximately $\frac{1-8}{10-0}$, which is equivalent to $\frac{-7}{10}$, or -0.7. Therefore, of the given choices, -0.7 is the closest to the slope of this line of best fit.

Choice A is incorrect. The line of best fit shown has a negative slope, not a positive slope.

Choice B is incorrect. The line of best fit shown has a negative slope, not a positive slope.

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

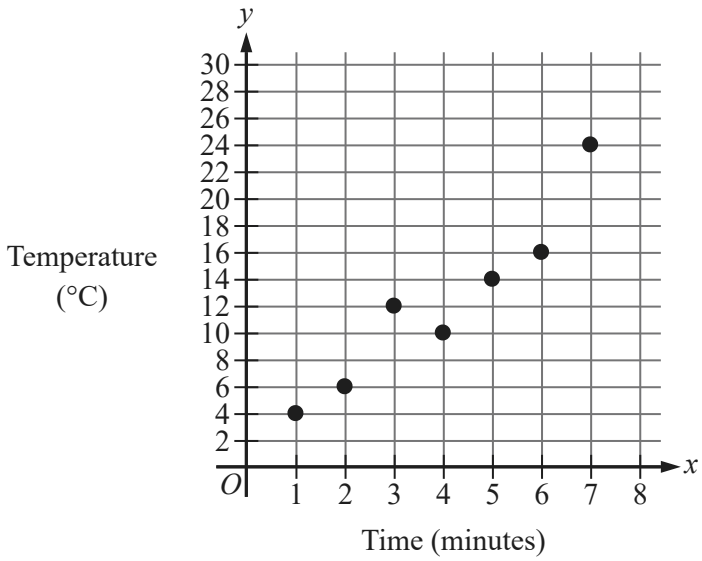
Question Difficulty: Medium

Question ID 21661dbf

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

ID: 21661dbf

During a study, the temperature, in degrees Celsius ($^\circ$C), of the air in a chamber was recorded to the nearest integer at certain times. The scatterplot shows the recorded temperature y, in $^\circ$C, of the air in the chamber x minutes after the start of the study.



What was the average rate of change, in $^\circ$C per minute, of the recorded temperature of the air in the chamber from $x = 5$ to $x = 7$?

ID: 21661dbf Answer

Correct Answer: 5

Rationale

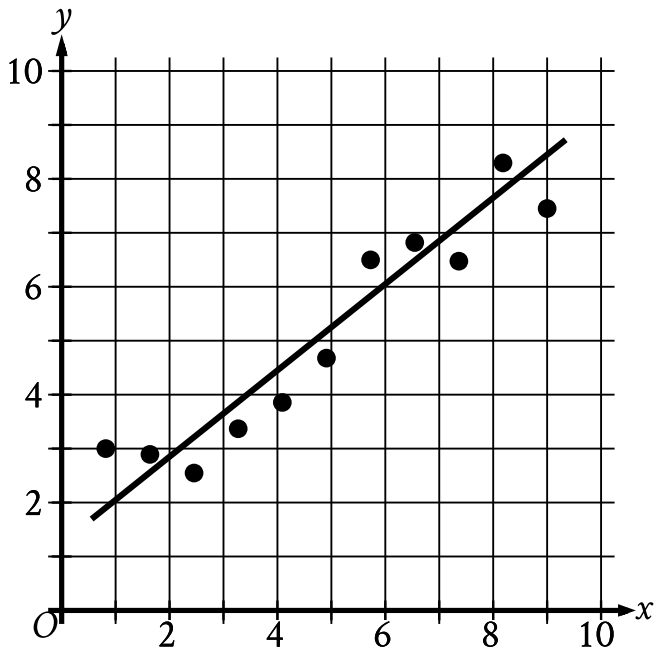
The correct answer is 5. For the graph shown, x represents time, in minutes, and y represents temperature, in degrees Celsius ($^\circ$C). Therefore, the average rate of change, in $^\circ$C per minute, of the recorded temperature of the air in the chamber between two x-values is the difference in the corresponding y-values divided by the difference in the x-values. The graph shows that at $x = 5$, the corresponding y-value is 14. The graph also shows that at $x = 7$, the corresponding y-value is 24. It follows that the average rate of change, in $^\circ$C per minute, from $x = 5$ to $x = 7$ is $\frac{24-14}{7-5}$, which is equivalent to $\frac{10}{2}$, or 5.

Question Difficulty: Medium

Question ID fed2d1b1

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

ID: fed2d1b1



The scatterplot shows the relationship between two variables, x and y. A line of best fit is also shown. For how many of the 11 data points does the line of best fit predict a greater y-value than the actual y-value?

ID: fed2d1b1 Answer

Correct Answer: 6

Rationale

The correct answer is 6. The line of best fit predicts a greater *y*-value than the actual *y*-value for any data point that's located below the line of best fit. For the scatterplot shown, 6 of the data points are below the line of best fit. Therefore, the line of best fit predicts a greater *y*-value than the actual *y*-value for 6 of the data points.

Question Difficulty: Medium

Question ID 8bea8625

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

ID: 8bea8625

Each year, the value of an investment increases by 0.49% of its value the previous year. Which of the following functions best models how the value of the investment changes over time?

A. Decreasing exponential

B. Decreasing linear

C. Increasing exponential

D. Increasing linear

ID: 8bea8625 Answer

Correct Answer: C

Rationale

Choice C is correct. Because the value of the investment increases each year, the function that best models how the value of the investment changes over time is an increasing function. It's given that each year, the value of the investment increases by 0.49% of its value the previous year. Since the value of the investment changes by a fixed percentage each year, the function that best models how the value of the investment changes over time is an exponential function. Therefore, the function that best models how the value of the investment changes over time is an increasing exponential function.

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.

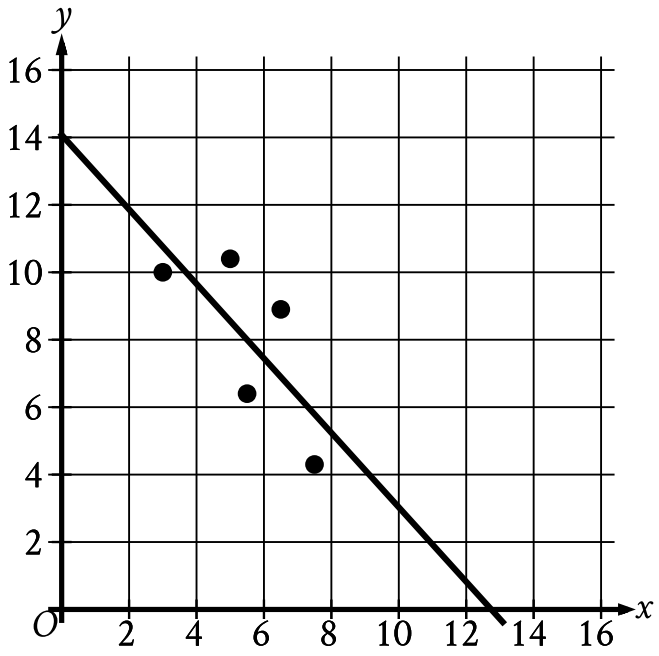
Question Difficulty: Medium

Question ID fc242959

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

ID: fc242959

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



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

A. -3.3

B. -1.1

C. 1.1

D. 3.3

ID: fc242959 Answer

Correct Answer: B

Rationale

Choice B is correct. A line in the *xy*-plane that passes through points (x_1, y_1) and (x_2, y_2) has a slope of $\frac{y_2-y_1}{x_2-x_1}$. The line of best fit shown passes approximately through the points $(0, 14)$ and $(13, 0)$. It follows that the slope of this line of best fit is approximately $\frac{0-14}{13-0}$, or $-\frac{14}{13}$. Of the given choices, -1.1 is closest to $-\frac{14}{13}$.

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.

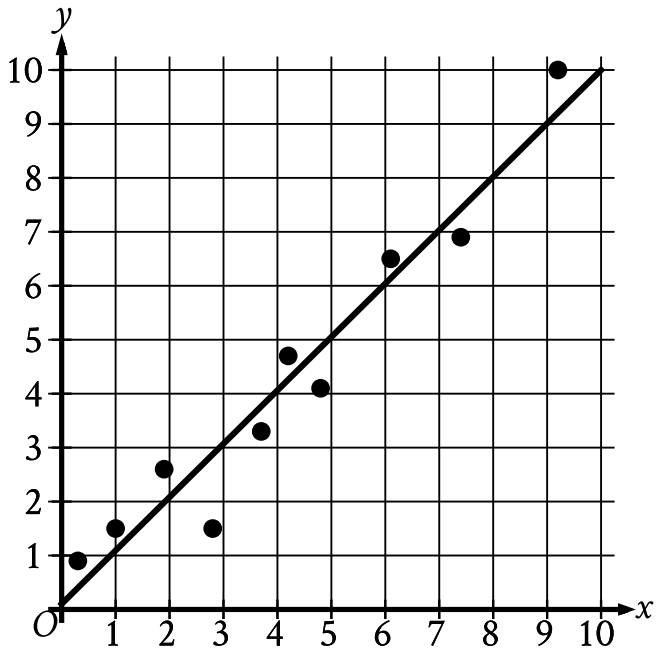
Question Difficulty: Medium

Question ID f006b049

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

ID: f006b049

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



For how many of the 10 data points is the actual *y*-value greater than the *y*-value predicted by the line of best fit?

A. 3

B. 4

C. 6

D. 7

ID: f006b049 Answer

Correct Answer: C

Rationale

Choice C is correct. Any data point that's located above the line of best fit has a *y*-value that's greater than the *y*-value predicted by the line of best fit. For the scatterplot shown, 6 of the data points are above the line of best fit. Therefore, 6 of the data points have an actual *y*-value that's greater than the *y*-value predicted by the line of best fit.

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

Choice B is incorrect. This is the number of data points that have an actual *y*-value that's less than the *y*-value predicted by the line of best fit.

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

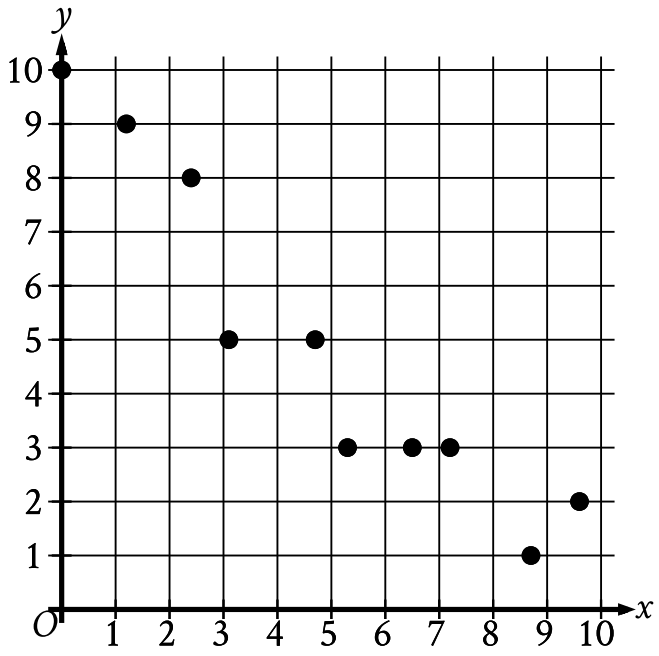
Question Difficulty: Medium

Question ID ce1b1751

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

ID: ce1b1751

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



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

A. $y = 0.9 + 9.4x$

B. $y = 0.9 - 9.4x$

C. $y = 9.4 + 0.9x$

D. $y = 9.4 - 0.9x$

ID: ce1b1751 Answer

Correct Answer: D

Rationale

Choice D is correct. The data points suggest that as the variable x increases, the variable y decreases, which implies that an appropriate linear model for the data has a negative slope. The data points also show that when x is close to 0, y is greater than 9. Therefore, the *y*-intercept of the graph of an appropriate linear model has a *y*-coordinate greater than 9. The graph of an equation of the form $y = a + bx$, where a and b are constants, has a *y*-intercept with a *y*-coordinate of a and has a slope of b. Of the given choices, only choice D represents a graph that has a negative slope, -0.9, and a *y*-intercept with a *y*-coordinate greater than 9, 9.4.

Choice A is incorrect. The graph of this equation has a positive slope, not a negative slope, and a *y*-intercept with a *y*-coordinate less than 1, not greater than 9.

Choice B is incorrect. The graph of this equation has a y-intercept with a y-coordinate less than 1, not greater than 9.

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

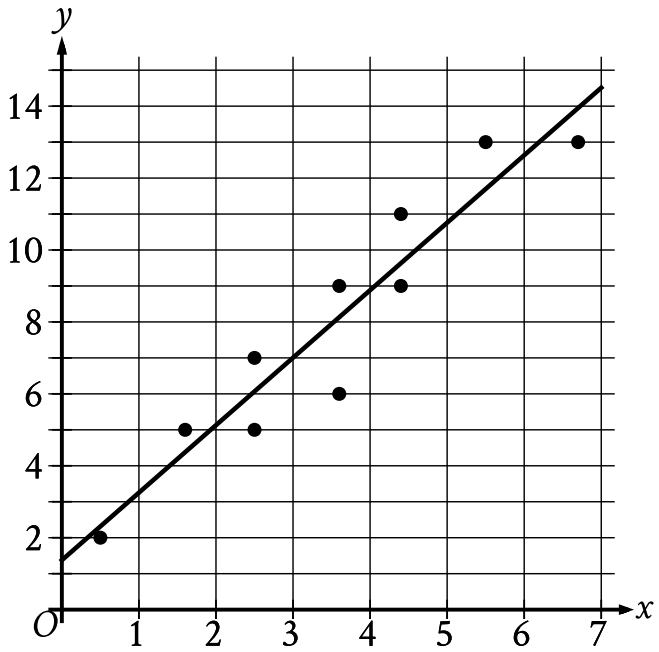
Question Difficulty: Medium

Question ID 291206f8

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

ID: 291206f8

In the given scatterplot, a line of best fit for the data is shown.



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

A. 0

B. $\frac{1}{2}$

C. 1

D. 2

ID: 291206f8 Answer

Correct Answer: D

Rationale

Choice D is correct. A line in the *xy*-plane that passes through the points (x_1, y_1) and (x_2, y_2) has a slope of $\frac{y_2-y_1}{x_2-x_1}$. The line of best fit shown passes approximately through the points $(1, 3.3)$ and $(7, 14.5)$. It follows that the slope of this best fit line is approximately $\frac{14.5-3.3}{7-1}$, which is equivalent to $\frac{11.2}{6}$, or approximately 1.87. Therefore, of the given choices, 2 is closest to the slope of the line of best fit shown.

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

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

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

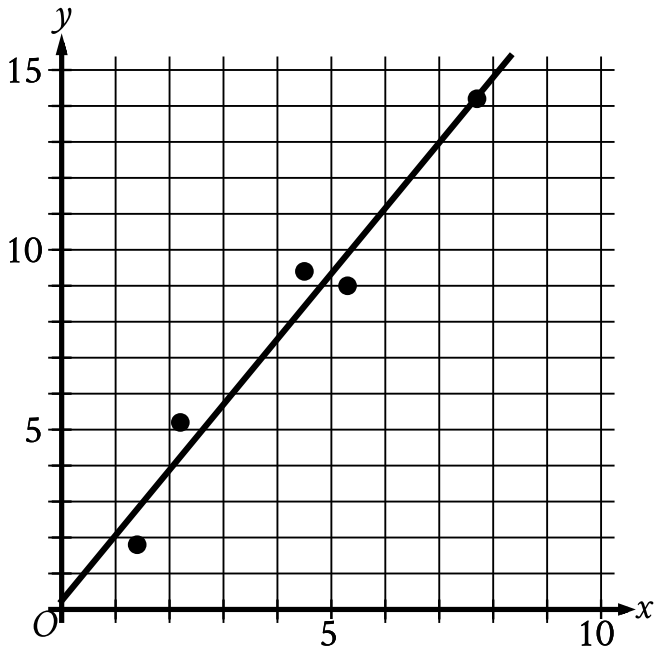
Question Difficulty: Medium

Question ID bc79626c

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

ID: bc79626c

In the given scatterplot, a line of best fit for the data is shown.



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

A. 0.2

B. 0.7

C. 1.8

D. 2.6

ID: bc79626c Answer

Correct Answer: C

Rationale

Choice C is correct. A line in the *xy*-plane that passes through points (x_1, y_1) and (x_2, y_2) has a slope of $\frac{y_2-y_1}{x_2-x_1}$. The line of best fit shown passes approximately through the points $(0, 0.2)$ and $(5, 9.3)$. It follows that the slope of this line is approximately $\frac{9.3-0.2}{5-0}$, which is equivalent to $\frac{9.1}{5}$, or 1.82. Therefore, of the given choices, 1.8 is closest to the slope of the line of best fit shown.

Choice A is incorrect. This value is closest to the *y*-coordinate of the *y*-intercept of the line of best fit shown.

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

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

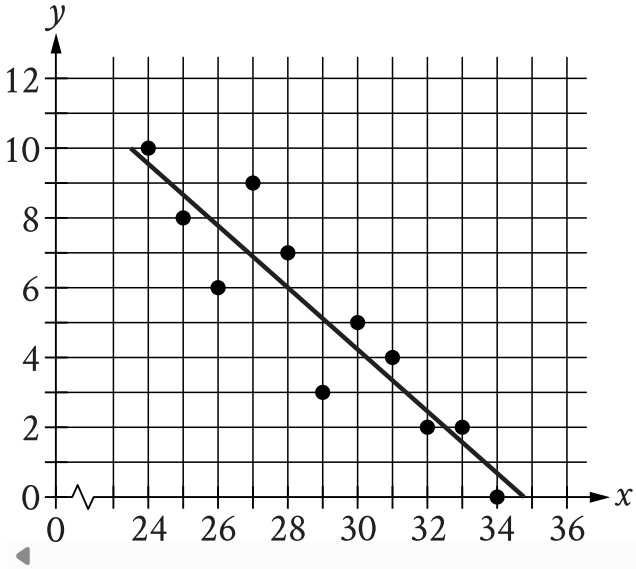
Question Difficulty: Medium

Question ID b160d8c8

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

ID: b160d8c8

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



At $x = 25.5$, which of the following is closest to the *y*-value predicted by the line of best fit?

A. 6.2

B. 7.3

C. 8.2

D. 9.1

ID: b160d8c8 Answer

Correct Answer: C

Rationale

Choice C is correct. On the line of best fit, an *x*-value of 25.5 corresponds to a *y*-value between 8 and 8.5. Therefore, at $x = 25.5$, 8.2 is closest to the *y*-value predicted by the line of best fit.

Choice A is incorrect and may result from conceptual errors.

Choice B is incorrect and may result from conceptual errors.

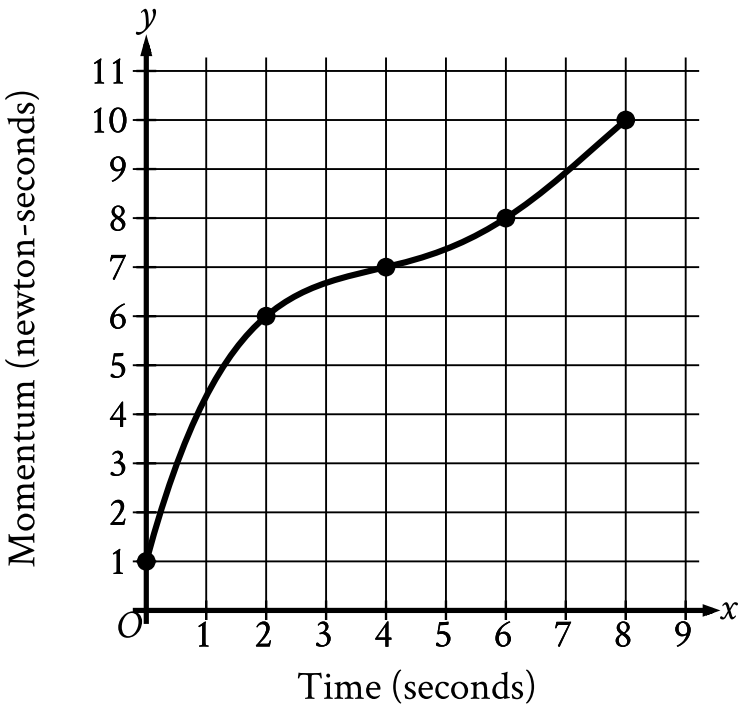
Choice D is incorrect and may result from conceptual errors.

Question Difficulty: Medium

Question ID b65a5036

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

ID: b65a5036



The graph shows the momentum y, in newton-seconds, of an object x seconds after the object started moving, for $0 \leq x \leq 8$. What is the average rate of change, in newton-seconds per second, in the momentum of the object from $x = 2$ to $x = 6$?

ID: b65a5036 Answer

Correct Answer: 0.5, 1/2

Rationale

The correct answer is $\frac{1}{2}$. For the graph shown, x represents time, in seconds, and y represents momentum, in newton-seconds. Therefore, the average rate of change, in newton-seconds per second, in the momentum of the object between two *x*-values is the difference in the corresponding *y*-values divided by the difference in the *x*-values. The graph shows that at $x = 2$, the corresponding *y*-value is 6. The graph also shows that at $x = 6$, the corresponding *y*-value is 8. It follows that the average rate of change, in newton-seconds per second, from $x = 2$ to $x = 6$ is $\frac{8-6}{6-2}$, which is equivalent to $\frac{2}{4}$, or $\frac{1}{2}$. Note that 1/2 and .5 are examples of ways to enter a correct answer.

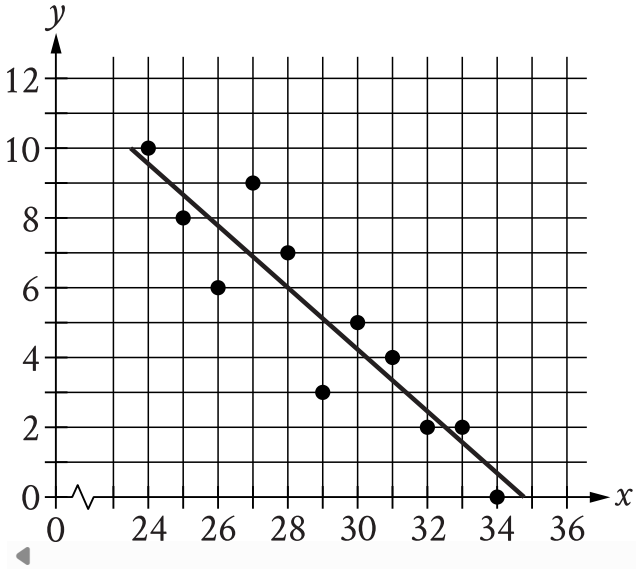
Question Difficulty: Medium

Question ID 4f783906

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

ID: 4f783906

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



At $x = 32$, which of the following is closest to the *y*-value predicted by the line of best fit?

A. 0.4

B. 1.5

C. 2.4

D. 3.3

ID: 4f783906 Answer

Correct Answer: C

Rationale

Choice C is correct. At $x = 32$, the line of best fit has a *y*-value between 2 and 3. The only choice with a value between 2 and 3 is choice C.

Choice A is incorrect. This is the difference between the *y*-value predicted by the line of best fit and the actual *y*-value at $x = 32$ rather than the *y*-value predicted by the line of best fit at $x = 32$.

Choice B is incorrect. This is the *y*-value predicted by the line of best fit at $x = 31$ rather than at $x = 32$.

Choice D is incorrect. This is the *y*-value predicted by the line of best fit at $x = 33$ rather than at $x = 32$.

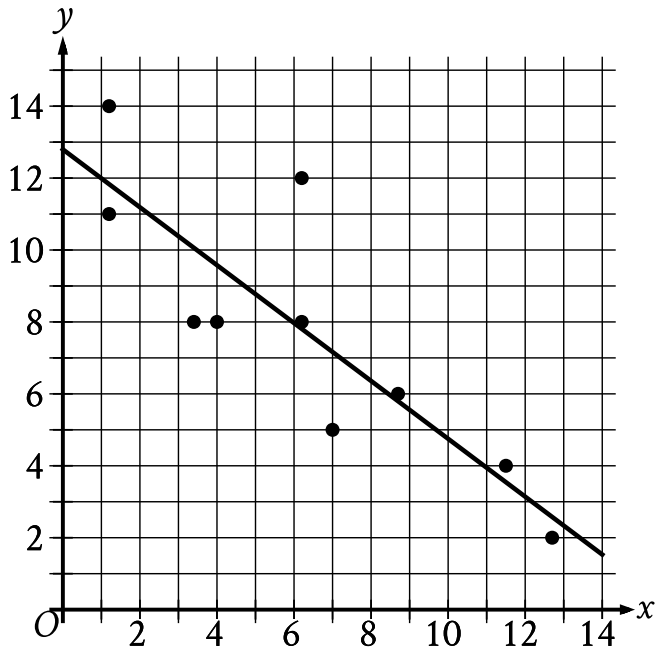
Question Difficulty: Medium

Question ID 845c6478

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

ID: 845c6478

The scatterplot shows the relationship between two variables, 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. -2.4

B. -0.8

C. 0.8

D. 2.4

ID: 845c6478 Answer

Correct Answer: B

Rationale

Choice B is correct. A line of best fit is shown in the scatterplot such that as the value of x increases, the value of y decreases. Thus, the slope of the line of best fit shown is negative. The slope of a line passing through two points, (x_1, y_1) and (x_2, y_2), can be calculated as $\frac{y_2-y_1}{x_2-x_1}$. The line of best fit shown passes approximately through the points $(1, 12)$ and $(11, 4)$. Substituting $(1, 12)$ and $(11, 4)$ for (x_1, y_1) and (x_2, y_2), respectively, in $\frac{y_2-y_1}{x_2-x_1}$ gives $\frac{4-12}{11-1}$, which is equivalent to $-\frac{8}{10}$, or -0.8. Therefore, of the given choices, -0.8 is closest to the slope of the line of best fit shown.

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

Choice C is incorrect. The line of best fit shown has a negative slope, not a positive slope.

Choice D is incorrect. The line of best fit shown has a negative slope, not a positive slope.

Question Difficulty: Medium