Question ID 82aaa0a1

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

ID: 82aaa0a1
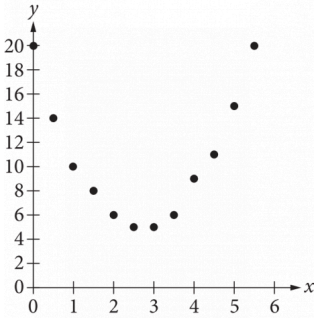
Of the following, which is the best model for the data in the scatterplot?

A. $y = 2x^2 - 11x - 20$

B. $y = 2x^2 - 11x + 20$

C. $y = 2x^2 - 5x - 3$

D. $y = 2x^2 - 5x + 3$

ID: 82aaa0a1 Answer

Correct Answer: B

Rationale

Choice B is correct. The graphical model that most closely fits the data in the scatterplot is a model in which the number of data points above and below the model are approximately balanced. Fitting a graphical model to the data shown results in an upward-facing parabola with a y-intercept near $(0,20)$ and a vertex with an approximate x-value of 2.5. Of the given choices, only choice B gives an equation of an upward-facing parabola with a y-intercept at $(0,20)$. Furthermore, substituting 2.5 for x into the equation in choice B yields $y = 5$. This is approximately the y-value of the vertex of the model.

Choices A, C, and D are incorrect. These equations don't give a graphical model that best fits the data. At $x = 0$, they have y-values of -20, -3, and 3, respectively. At $x = 2.5$, they have y-values of -35, -3, and 3, respectively.

Question Difficulty: Easy

Question ID 83272c51

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

ID: 83272c51

Temperature of a Cup of Coffee during an Experiment
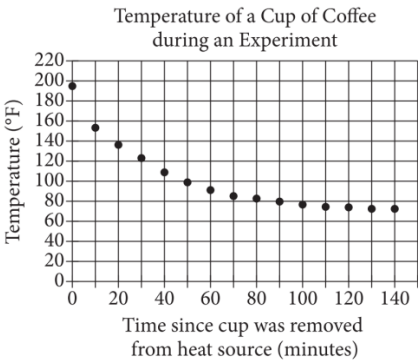
In an experiment, a heated cup of coffee is removed from a heat source, and the cup of coffee is then left in a room that is kept at a constant temperature. The graph above shows the temperature, in degrees Fahrenheit (°F), of the coffee immediately after being removed from the heat source and at 10-minute intervals thereafter. During which of the following 10-minute intervals does the temperature of the coffee decrease at the greatest average rate?

A. Between 0 and 10 minutes

B. Between 30 and 40 minutes

C. Between 50 and 60 minutes

D. Between 90 and 100 minutes

ID: 83272c51 Answer

Correct Answer: A

Rationale

Choice A is correct. The average rate of change in temperature of the coffee in degrees Fahrenheit per minute is calculated by dividing the difference between two recorded temperatures by the number of minutes in the corresponding interval of time. Since the time intervals given are all 10 minutes, the average rate of change is greatest for the points with the greatest difference in temperature. Of the choices, the greatest difference in temperature occurs between 0 and 10 minutes.
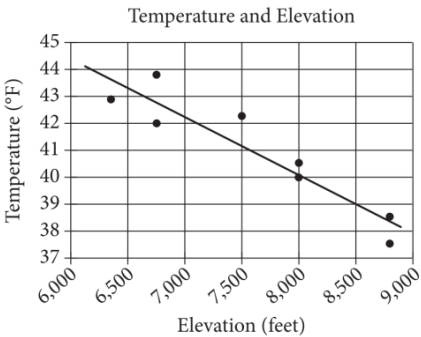
Choices B, C, and D are incorrect and may result from misinterpreting the average rate of change from the graph.

Question Difficulty: Easy

Question ID ac5b6558

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

ID: ac5b6558

Temperature and Elevation

The scatterplot above shows the high temperature on a certain day and the elevation of 8 different locations in the Lake Tahoe Basin. A line of best fit for the data is also shown. What temperature is predicted by the line of best fit for a location in the Lake Tahoe Basin with an elevation of 8,500 feet?

A. 37°F

B. 39°F

C. 41°F

D. 43°F

ID: ac5b6558 Answer

Correct Answer: B

Rationale

Choice B is correct. The line of best fit passes through the point $(8,500, 39)$. Therefore, the line of best fit predicts a temperature of 39°F for a location in Lake Tahoe Basin with an elevation of 8,500 feet.

Choice A is incorrect. This is the lowest temperature listed on the scatterplot, and the line of best fit never crosses this value for any of the elevations shown. Choice C is incorrect. According to the line of best fit, the temperature of 41°F is predicted for an elevation of slightly greater than 7,500 feet, not an elevation of 8,500 feet. Choice D is incorrect. According to the line of best fit, the temperature of 43°F is predicted for an elevation of roughly 6,700 feet, not an elevation of 8,500 feet.
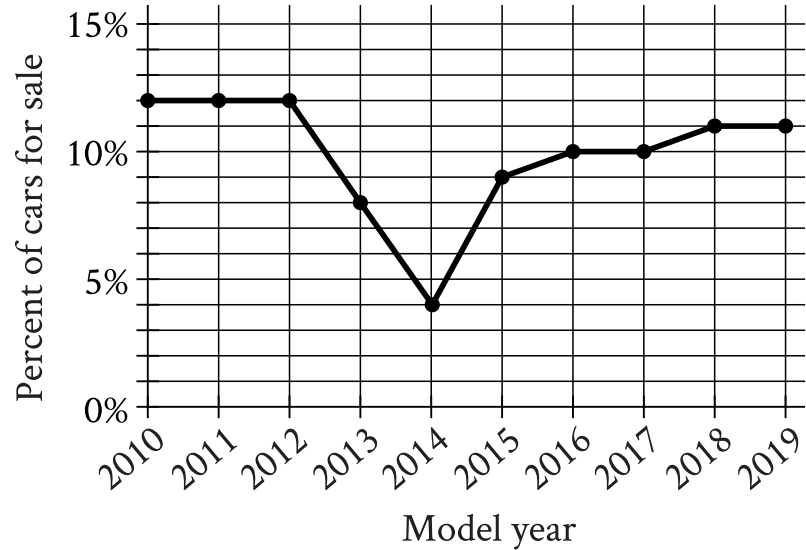
Question Difficulty: Easy

Question ID 4a2264b3

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

ID: 4a2264b3

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: 4a2264b3 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 74dee52b

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

ID: 74dee52b
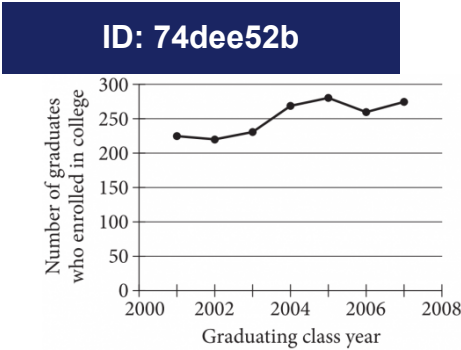
The line graph shows the number of graduates from the classes of 2001 through 2007 at a certain school who enrolled in college within 24 months of graduation. Of the following, which class had the fewest graduates who enrolled in college within 24 months of graduation?

A. 2002

B. 2004

C. 2005

D. 2007

ID: 74dee52b Answer

Correct Answer: A

Rationale

Choice A is correct. The year with the fewest graduates who enrolled in college within 24 months of graduation is the point with the lowest value on the vertical axis. This occurs at 2002.

Choice B, C, and D are incorrect. The years 2004, 2005, and 2007 each had a greater number of graduates who enrolled in college within 24 months of graduation than did the year 2002.

Question Difficulty: Easy

Question ID 9d88a3e3

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

Theresa's Running Speed and Time
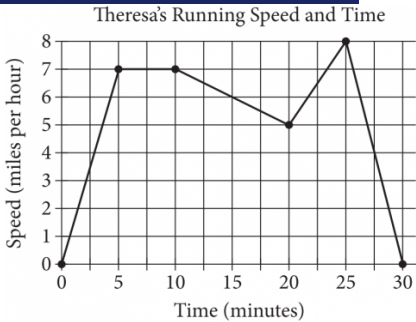
Theresa ran on a treadmill for thirty minutes, and her time and speed are shown on the graph above. According to the graph, which of the following statements is NOT true concerning Theresa's run?

A. Theresa ran at a constant speed for five minutes.

B. Theresa's speed was increasing for a longer period of time than it was decreasing.

C. Theresa's speed decreased at a constant rate during the last five minutes.

D. Theresa's speed reached its maximum during the last ten minutes.

Correct Answer: B

Rationale

Choice B is correct. Theresa's speed was increasing from 0 to 5 minutes and from 20 to 25 minutes, which is a total of 10 minutes. Theresa's speed was decreasing from 10 minutes to 20 minutes and from 25 to 30 minutes, which is a total of 15 minutes. Therefore, Theresa's speed was NOT increasing for a longer period of time than it was decreasing.

Choice A is incorrect. Theresa ran at a constant speed for the 5-minute period from 5 to 10 minutes. Choice C is incorrect. Theresa's speed decreased at a constant rate during the last 5 minutes, which can be seen since the graph is linear during that time. Choice D is incorrect. Theresa's speed reached its maximum at 25 minutes, which is within the last 10 minutes.

Question Difficulty: Easy

Question ID c9dd92b1

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

ID: c9dd92b1

Density of Grape Juice
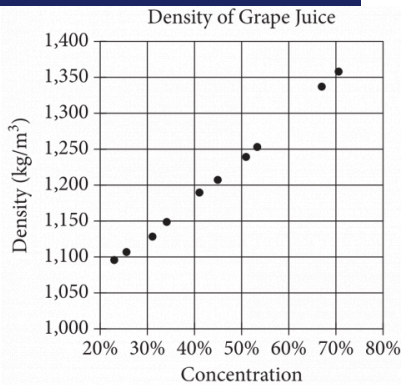
The densities of different concentrations of grape juice are shown in the scatterplot above. According to the trend shown by the data, which of the following is closest to the predicted density, in kilograms per cubic meter (kg/m^3), for grape juice with a concentration of 60%?

A. 1,200

B. 1,250

C. 1,300

D. 1,350

ID: c9dd92b1 Answer

Correct Answer: C

Rationale

Choice C is correct. The data in the scatterplot show an increasing linear trend. The density when the juice concentration is 60% will be between the densities shown at about 53% and 67% concentration, or between about 1,255 and 1,340 kg/m^3. Of the choices given, only 1,300 falls within this range.
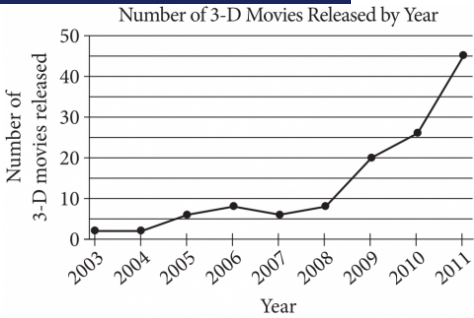
Choices A, B, and D are incorrect. These are the approximate densities of grape juice with a concentration of 45%, 55%, and 70%, respectively.

Question Difficulty: Easy

Question ID a6b2fcce

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

ID: a6b2fcce

Number of 3-D Movies Released by Year

According to the line graph above, between which two consecutive years was there the greatest change in the number of 3-D movies released?

A. 2003−2004

B. 2008−2009

C. 2009−2010

D. 2010−2011

ID: a6b2fcce Answer

Correct Answer: D

Rationale

Choice D is correct. The change in the number of 3-D movies released between any two consecutive years can be found by first estimating the number of 3-D movies released for each of the two years and then finding the positive difference between these two estimates. Between 2003 and 2004, this change is approximately $2 - 2 = 0$ movies; between 2008 and 2009, this change is approximately $20 - 8 = 12$ movies; between 2009 and 2010, this change is approximately $26 - 20 = 6$ movies; and between 2010 and 2011, this change is approximately $46 - 26 = 20$ movies. Therefore, of the pairs of consecutive years in the choices, the greatest increase in the number of 3-D movies released occurred during the time period between 2010 and 2011.

Choices A, B, and C are incorrect. Between 2010 and 2011, approximately 20 more 3-D movies were released. The change in the number of 3-D movies released between any of the other pairs of consecutive years is significantly smaller than 20.

Question Difficulty: Easy

Question ID 9296553d

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Problem-Solving and Data Analysis	Two-variable data: Models and scatterplots	■ ☐ ☐
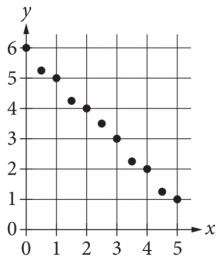
Which of the following could be an equation for a line of best fit for the data in the scatterplot?

A. $y = -x + 6$

B. $y = -x - 6$

C. $y = 6x + 1$

D. $y = 6x - 1$

ID: 9296553d Answer

Correct Answer: A

Rationale

Choice A is correct. A line of best fit for the data in a scatterplot is a line that follows the trend of the data with approximately half the data points above and half the data points below the line. Based on the given data, a line of best fit will have a positive y-intercept on or near the point $(0,6)$ and a negative slope. All of the choices are in slope-intercept form $y = mx + b$, where m is the slope and b is the y-coordinate of the y-intercept. Only choice A is an equation of a line with a positive y-intercept at $(0,6)$ and a negative slope, -1.

Choice B is incorrect. This equation is for a line that has a negative y-intercept, not a positive y-intercept. Choices C and D are incorrect and may result from one or more sign errors and from switching the values of the y-intercept and the slope in the equation.

Question Difficulty: Easy

Question ID d6121490

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

ID: d6121490

Braking Distance versus Speed
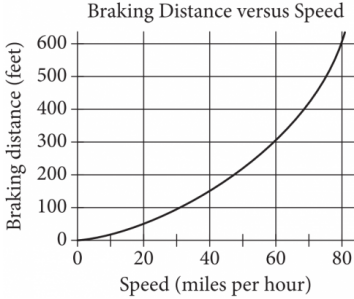
The graph above shows the relationship between the speed of a particular car, in miles per hour, and its corresponding braking distance, in feet. Approximately how many feet greater will the car's braking distance be when the car is traveling at 50 miles per hour than when the car is traveling at 30 miles per hour?

A. 75

B. 125

C. 175

D. 250

ID: d6121490 Answer

Correct Answer: B

Rationale

Choice B is correct. According to the graph, when the car is traveling at 50 miles per hour, the braking distance is approximately 225 feet, and when the car is traveling at 30 miles per hour, the braking distance is approximately 100 feet. The difference between these braking distances is $225 - 100$, or 125 feet.

Choice A is incorrect and may result from finding the braking distance for 20 miles per hour, the difference between the given speeds. Choice C is incorrect and may result from subtracting the speed from the braking distance at 50 miles per hour. Choice D is incorrect and may result from finding the difference in the braking distances at 60 and 20 miles per hour.

Question Difficulty: Easy

Question ID 8156d446

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

Number of Beach Visitors versus Temperature
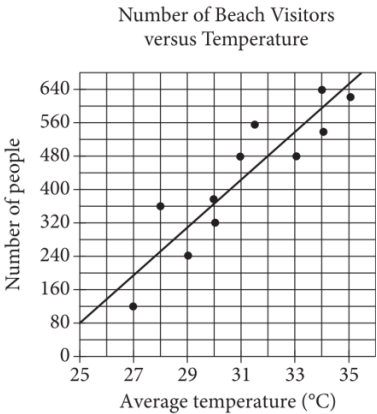
Each dot in the scatterplot above represents the temperature and the number of people who visited a beach in Lagos, Nigeria, on one of eleven different days. The line of best fit for the data is also shown. According to the line of best fit, what is the number of people, rounded to the nearest 10, predicted to visit this beach on a day with an average temperature of 32°C?

ID: 8156d446 Answer

Rationale

The correct answer is 480. An average temperature of $32°C$ corresponds to the value 32 on the x-axis. On the line of best fit, an x-value of 32 corresponds to a y-value of 480. The values on the y-axis correspond to the number of people predicted to visit this beach. Therefore, 480 people are predicted to visit this beach on a day with an average temperature of $32°C$.
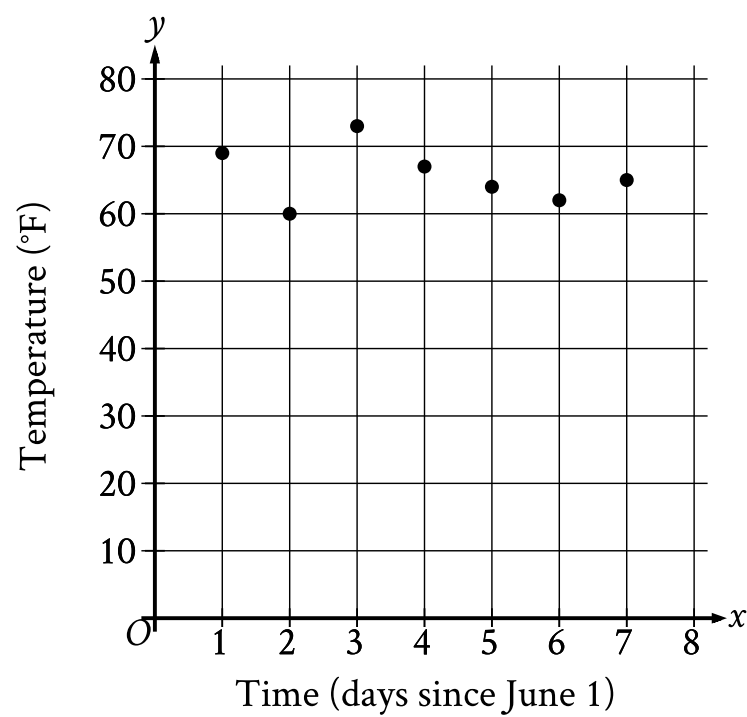
Question Difficulty: Easy

Question ID d112bc9d

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

ID: d112bc9d

The scatterplot shows the temperature y, in $°F$, recorded by a meteorologist at various times x, in days since June 1.

Time (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: d112bc9d 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 $(70 - 60)°F$, 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 $(70 - 60)°F$, 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 5c24c861

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

ID: 5c24c861

A study was done to determine a new car's stopping distance when it was traveling at different speeds. The study was done on a dry road with good surface conditions. The results are shown below, along with the graph of a quadratic function that models the data.

Vehicle Stopping Distance
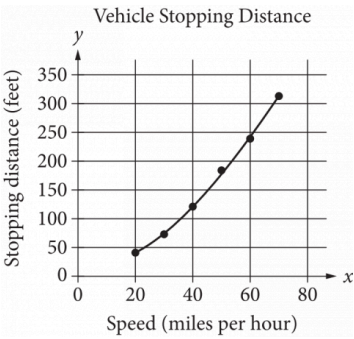
According to the model, which of the following is the best estimate for the stopping distance, in feet, if the vehicle was traveling 55 miles per hour?

A. 25

B. 30

C. 210

D. 250

ID: 5c24c861 Answer

Correct Answer: C

Rationale

Correct Answer Rationale
Choice C is correct. According to the model, the stopping distance, in feet, of a vehicle traveling 55 miles per hour is about 200 feet. Of the choices given, the best estimate of the stopping distance for a car traveling 55 miles per hour is 210 feet.
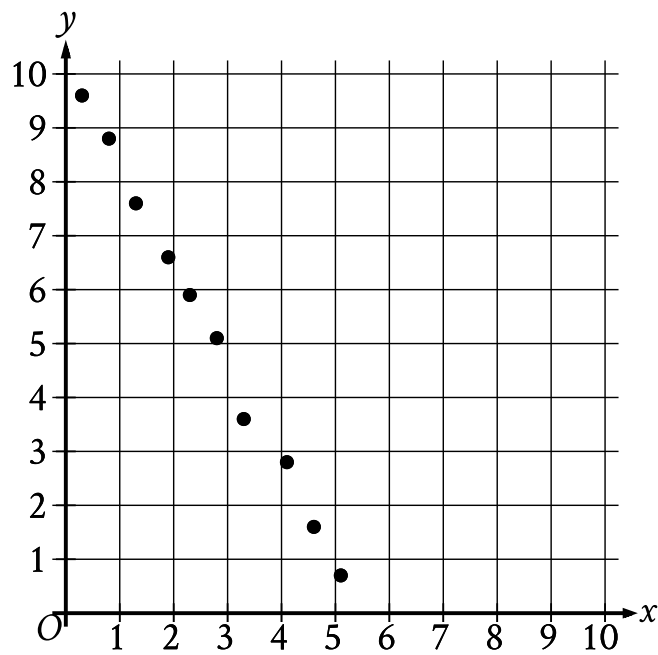
Incorrect Answer Rationale
Choices A, B, and D are incorrect and may be the result of incorrectly reading the given quadratic model. The corresponding x-values to the y-values of 25 and 30 are not part of the model. The corresponding x-value to a y-value of 250 is approximately 60 mph, not 55 mph.

Question Difficulty: Easy

Question ID 5f3ee607

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

ID: 5f3ee607

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: 5f3ee607 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.
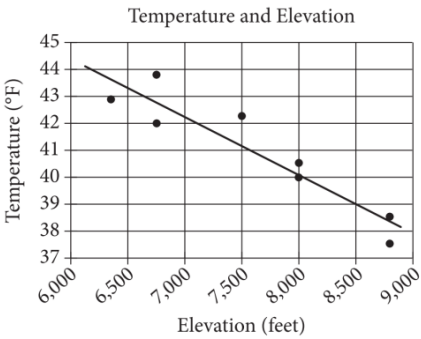
Choice D is incorrect. The graph of this model has a positive slope, not a negative slope.

Question Difficulty: Easy

Question ID 661dfddd

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

ID: 661dfddd

Temperature and Elevation

The scatterplot above shows the high temperature on a certain day and the elevation of 8 different locations in the Lake Tahoe Basin. A line of best fit for the data is also shown. Which of the following statements best describes the association between the elevation and the temperature of locations in the Lake Tahoe Basin?

A. As the elevation increases, the temperature tends to increase.

B. As the elevation increases, the temperature tends to decrease.

C. As the elevation decreases, the temperature tends to decrease.

D. There is no association between the elevation and the temperature.

ID: 661dfddd Answer

Correct Answer: B

Rationale

Choice B is correct. The association between the elevation and the temperature of locations in the Lake Tahoe Basin can be described by looking at the direction of the line of best fit. The line of best fit slopes downward, which corresponds to the temperature decreasing as the elevation increases.

Choices A and C are incorrect. Both of these choices would be represented by a line of best fit that slopes from the lower left to the upper right of the graph, which isn't what's shown on the graph. Choice D is incorrect. This choice would be represented by a line of best fit that is horizontal or has a slope very close to 0. This is not what's shown on the graph.
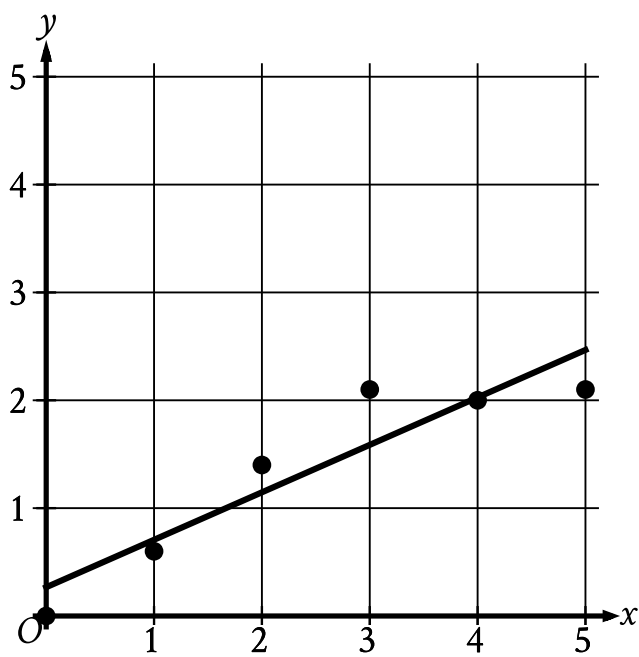
Question Difficulty: Easy

Question ID 39aa146d

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

ID: 39aa146d

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: 39aa146d 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.
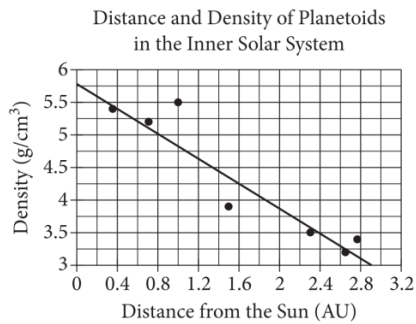
Choice D is incorrect and may result from conceptual or calculation errors.

Question Difficulty: Easy

Question ID cf0ae57a

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

ID: cf0ae57a

Distance and Density of Planetoids in the Inner Solar System

The scatterplot above shows the densities of 7 planetoids, in grams per cubic centimeter, with respect to their average distances from the Sun in astronomical units (AU). The line of best fit is also shown. An astronomer has discovered a new planetoid about 1.2 AU from the Sun. According to the line of best fit, which of the following best approximates the density of the planetoid, in grams per cubic centimeter?

A. 3.6

B. 4.1

C. 4.6

D. 5.5

ID: cf0ae57a Answer

Correct Answer: C

Rationale

Choice C is correct. According to the line of best fit, a planetoid with a distance from the Sun of 1.2 AU has a predicted density between 4.5 g/cm^3 and 4.75 g/cm^3. The only choice in this range is 4.6.

Choices A, B, and D are incorrect and may result from misreading the information in the scatterplot.

Question Difficulty: Easy