Question Bank

Math

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Linear Function

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Question ID 84664a7c

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■□□

ID: 84664a7c

The front of a roller-coaster car is at the bottom of a hill and is 15 feet above the ground. If the front of the roller-coaster car rises at a constant rate of 8 feet per second, which of the following equations gives the height h, in feet, of the front of the roller-coaster car s seconds after it starts up the hill?

A. $h = 8s + 15$

B. $h = 15s + \frac{335}{8}$

C. $h = 8s + \frac{335}{15}$

D. $h = 15s + 8$

Question ID 06fc1726

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■□□

ID: 06fc1726

If f is the function defined by $f(x) = \frac{2x-1}{3}$, what is the value of $f(5)$?

A. $\frac{4}{3}$

B. $\frac{7}{3}$

C. 3

D. 9

Question ID 6863c7ce

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■□□

ID: 6863c7ce

$$d = 16t$$

The given equation represents the distance d, in inches, where t represents the number of seconds since an object started moving. Which of the following is the best interpretation of 16 in this context?

A. The object moved a total of 16 inches.

B. The object moved a total of $16t$ inches.

C. The object is moving at a rate of 16 inches per second.

D. The object is moving at a rate of $\frac{1}{16}$ inches per second.

Question ID bf36c815

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■□□

ID: bf36c815

The function g is defined by $g(x) = -x + 8$.

What is the value of $g(0)$?

A. -8

B. 0

C. 4

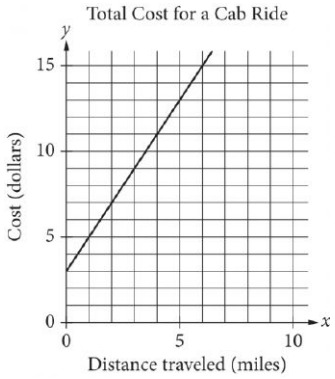
D. 8

Question ID 3f5375d9

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■□□

ID: 3f5375d9

The line graphed in the *xy*-plane below models the total cost, in dollars, for a cab ride, *y*, in a certain city during nonpeak hours based on the number of miles traveled, *x*.



According to the graph, what is the cost for each additional mile traveled, in dollars, of a cab ride?

A. $2.00

B. $2.60

C. $3.00

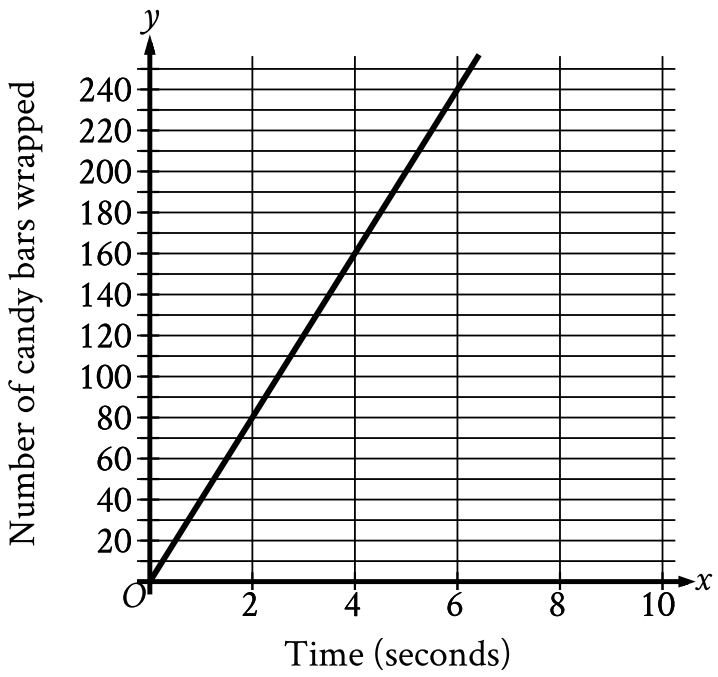
D. $5.00

Question ID 13294295

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■□□

ID: 13294295

The graph shown models the number of candy bars a certain machine wraps with a label in x seconds.



According to the graph, what is the estimated number of candy bars the machine wraps with a label per second?

A. 2

B. 40

C. 78

D. 80

Question ID 12983c1e

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■□□

ID: 12983c1e

x	$f(x)$
1	5
3	13
5	21

Some values of the linear function f are shown in the table above.
Which of the following defines f ?

A. $f(x)=2x+3$

B. $f(x)=3x+2$

C. $f(x)=4x+1$

D. $f(x)=5x$

Question ID f79fffba

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■□□

ID: f79fffba

The function h is defined by $h(x) = 3x - 7$. What is the value of $h(-2)$?

A. -13

B. -10

C. 10

D. 13

Question ID 3462d850

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■□□

ID: 3462d850

Marisol drove 3 hours from City A to City B. The equation below estimates the distance d, in miles, Marisol traveled after driving for t hours.

$d = 45t$

Which of the following does 45 represent in the equation?

A. Marisol took 45 trips from City A to City B.

B. The distance between City A and City B is 45 miles.

C. Marisol drove at an average speed of about 45 miles per hour.

D. It took Marisol 45 hours to drive from City A to City B.

Question ID 255996a6

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■□□

ID: 255996a6

$T = 1{,}000 + 18h$

In the equation above, T represents Brittany's total take-home pay, in dollars, for her first week of work, where h represents the number of hours she worked that week and 1,000 represents a sign-on bonus. If Brittany's total take-home pay was $1,576, for how many hours was Brittany paid for her first week of work?

A. 16

B. 32

C. 55

D. 88

Question ID a1696f3e

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■□□

ID: a1696f3e

The function g is defined as $g(x) = 5x + a$, where a is a constant. If $g(4) = 31$, what is the value of a ?

A. 30

B. 22

C. 11

D. -23

Question ID 13909d78

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■□□

ID: 13909d78

The function f is defined by the equation $f(x) = 100x + 2$. What is the value of $f(x)$ when $x = 9$?

A. 111

B. 118

C. 900

D. 902

Question ID de6fe450

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■□□

ID: de6fe450

On January 1, 2015, a city's minimum hourly wage was $9.25. It will increase by $0.50 on the first day of the year for the next 5 years. Which of the following functions best models the minimum hourly wage, in dollars, x years after January 1, 2015, where $x = 1, 2, 3, 4, 5$?

A. $f(x) = 9.25 - 0.50x$

B. $f(x) = 9.25x - 0.50$

C. $f(x) = 9.25 + 0.50x$

D. $f(x) = 9.25x + 0.50$

Question ID cee5b352

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■□□

ID: cee5b352

The length, y, of a white whale was 162 centimeters (cm) when it was born and increased an average of 4.8 cm per month for the first 12 months after it was born. Which equation best represents this situation, where x is the number of months after the whale was born and y is the length, in cm, of the whale?

A. $y = 162x$

B. $y = 162x + 162$

C. $y = 4.8x + 4.8$

D. $y = 4.8x + 162$

Question ID 81390d6c

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■□□

ID: 81390d6c

The function h is defined by $h(x) = x + 200$. What is the value of $h(50)$?

A. 200

B. 250

C. $10{,}000$

D. $50{,}200$

Question ID 2eef7e61

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■□□

ID: 2eef7e61

The graph of the function *f* is a line in the *xy*-plane. If the line has slope $\frac{3}{4}$ and $f(0)=3$, which of the following defines *f*?

A. $f(x)=\frac{3}{4}x-3$

B. $f(x)=\frac{3}{4}x+3$

C. $f(x)=4x-3$

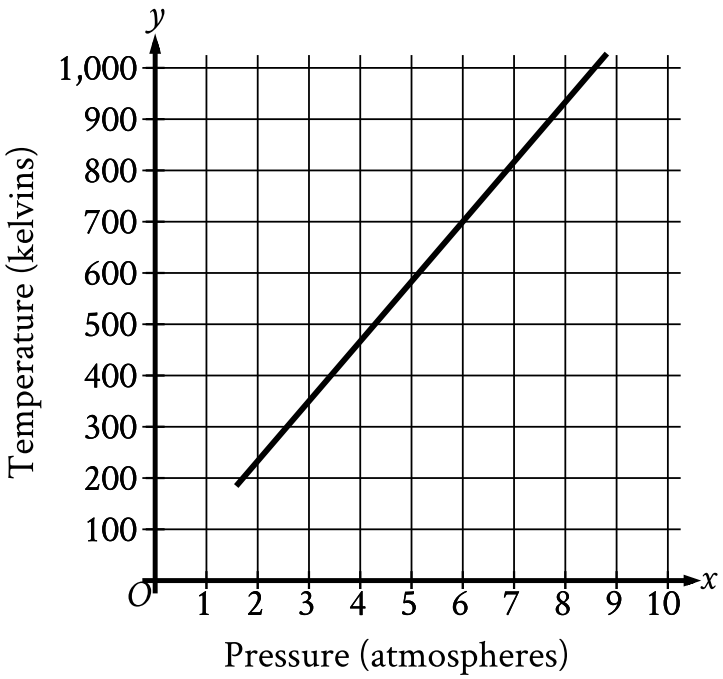
D. $f(x)=4x+3$

Question ID 0ea7ef01

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■□□

ID: 0ea7ef01

Oxygen gas is placed inside a tank with a constant volume. The graph shows the estimated temperature y, in kelvins, of the oxygen gas when its pressure is x atmospheres.



What is the estimated temperature, in kelvins, of the oxygen gas when its pressure is 6 atmospheres?

A. 6

B. 60

C. 700

D. 760

Question ID 1ecaa9c0

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■□□

ID: 1ecaa9c0

Robert rented a truck to transport materials he purchased from a hardware store. He was charged an initial fee of $20.00 plus an additional $0.70 per mile driven. If the truck was driven 38 miles, what was the total amount Robert was charged?

A. $46.60

B. $52.90

C. $66.90

D. $86.50

Question ID 8643d906

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■□□

ID: 8643d906

$P(t) = 250 + 10t$

The population of snow leopards in a certain area can be modeled by the function P defined above, where $P(t)$ is the population t years after 1990.

Of the following, which is the best interpretation of the equation $P(30) = 550$?

A. The snow leopard population in this area is predicted to be 30 in the year 2020.

B. The snow leopard population in this area is predicted to be 30 in the year 2030.

C. The snow leopard population in this area is predicted to be 550 in the year 2020.

D. The snow leopard population in this area is predicted to be 550 in the year 2030.

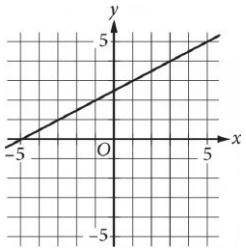
Question ID a8e6bd75

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■□□

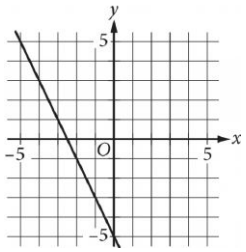
ID: a8e6bd75

Which of the following is the graph of the equation $y = 2x - 5$ in the *xy*-plane?

A.



B.



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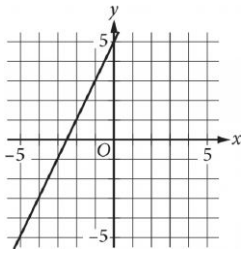
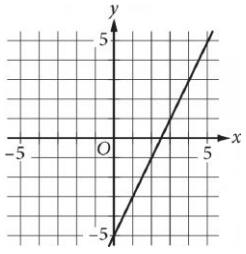


D.



Question ID e62cfe5f

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■□

ID: e62cfe5f

According to a model, the head width, in millimeters, of a worker bumblebee can be estimated by adding 0.6 to four times the body weight of the bee, in grams. According to the model, what would be the head width, in millimeters, of a worker bumblebee that has a body weight of 0.5 grams?

Question ID 7e3f8363

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■□

ID: 7e3f8363

In the *xy*-plane, the graph of the linear function f contains the points $(0, 3)$ and $(7, 31)$. Which equation defines f, where $y = f(x)$?

A. $f(x) = 28x + 34$

B. $f(x) = 3x + 38$

C. $f(x) = 4x + 3$

D. $f(x) = 7x + 3$

Question ID 620fe971

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■□

ID: 620fe971

A team of workers has been moving cargo off of a ship. The equation below models the approximate number of tons of cargo, y, that remains to be moved x hours after the team started working.

$y = 120 - 25x$

The graph of this equation in the xy-plane is a line. What is the best interpretation of the x-intercept in this context?

A. The team will have moved all the cargo in about 4.8 hours.

B. The team has been moving about 4.8 tons of cargo per hour.

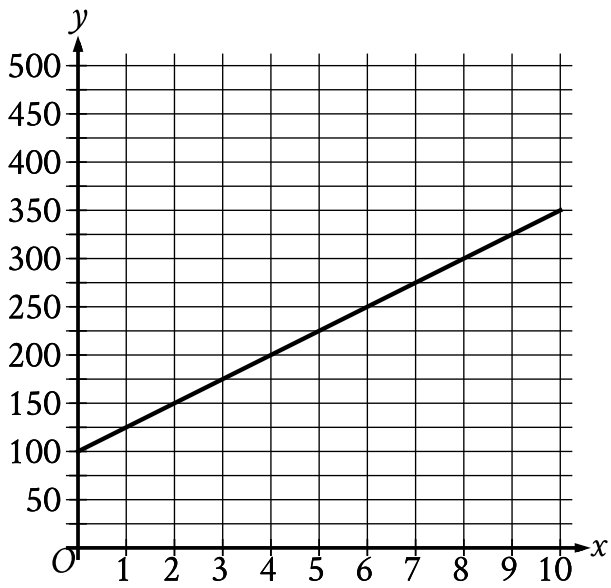
C. The team has been moving about 25 tons of cargo per hour.

D. The team started with 120 tons of cargo to move.

Question ID 5cf1bbc9

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■□

ID: 5cf1bbc9



The graph of the function f, where $y = f(x)$, gives the total cost y, in dollars, for a certain video game system and x games. What is the best interpretation of the slope of the graph in this context?

A. Each game costs $\$25$.

B. The video game system costs $\$100$.

C. The video game system costs $\$25$.

D. Each game costs $\$100$.

Question ID dae126d7

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■□

ID: dae126d7

The boiling point of water at sea level is 212 degrees Fahrenheit $(°F)$. For every 550 feet above sea level, the boiling point of water is lowered by about $1°F$. Which of the following equations can be used to find the boiling point B of water, in $°F$, x feet above sea level?

A. $B = 550 + \frac{x}{212}$

B. $B = 550 - \frac{x}{212}$

C. $B = 212 + \frac{x}{550}$

D. $B = 212 - \frac{x}{550}$

Question ID 271f7e3f

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■□

ID: 271f7e3f

$$f(x) = \frac{(x+7)}{4}$$

For the function f defined above, what is the value of $f(9) - f(1)$?

A. 1

B. 2

C. $\frac{1}{4}$

D. $\frac{9}{4}$

Question ID c651cc56

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■□

ID: c651cc56

x	$f(x)$
0	−2
2	4
6	16

Some values of the linear function f are shown in the table above. What is the value of $f(3)$?

A. 6

B. 7

C. 8

D. 9

Question ID c22b5f25

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■□

ID: c22b5f25

In the *xy*-plane, the points $(-2,3)$ and $(4,-5)$ lie on the graph of which of the following linear functions?

A. $f(x)=x+5$

B. $f(x)=\frac{1}{2}x+4$

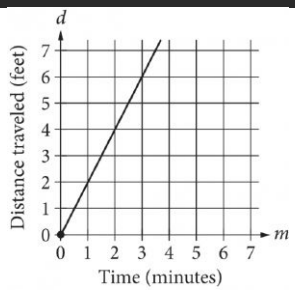
C. $f(x)=-\frac{4}{3}x+\frac{1}{3}$

D. $f(x)=-\frac{3}{2}x+1$

Question ID 11e1ab81

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■□

ID: 11e1ab81



The graph above shows the distance traveled d, in feet, by a product on a conveyor belt m minutes after the product is placed on the belt. Which of the following equations correctly relates d and m ?

A. $d = 2m$

B. $d = \frac{1}{2}m$

C. $d = m + 2$

D. $d = 2m + 2$

Question ID 4fe4fd7c

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■□

ID: 4fe4fd7c

$c(x) = mx + 500$

A company's total cost $c(x)$, in dollars, to produce *x* shirts is given by the function above, where *m* is a constant and $x > 0$. The total cost to produce 100 shirts is $800. What is the total cost, in dollars, to produce 1000 shirts? (Disregard the $ sign when gridding your answer.)

Question ID 3122fc7b

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■□

ID: 3122fc7b

A linear model estimates the population of a city from 1991 to 2015. The model estimates the population was 57 thousand in 1991, 224 thousand in 2011, and x thousand in 2015. To the nearest whole number, what is the value of x?

Question ID c01f4a95

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■□

ID: c01f4a95

$$j(x) = mx + 144$$

For the linear function j, m is a constant and $j(12) = 18$. What is the value of $j(10)$?

Question ID 868fc236

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■□

ID: 868fc236

Energy per Gram of Typical Macronutrients

Macronutrient	Food calories	Kilojoules
Protein	4.0	16.7
Fat	9.0	37.7
Carbohydrate	4.0	16.7

The table above gives the typical amounts of energy per gram, expressed in both food calories and kilojoules, of the three macronutrients in food. If x food calories is equivalent to k kilojoules, of the following, which best represents the relationship between x and k ?

A. $k = 0.24x$

B. $k = 4.2x$

C. $x = 4.2k$

D. $xk = 4.2$

Question ID 042aa429

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■□

ID: 042aa429

If $f(x) = x + 7$ and $g(x) = 7x$, what is the value of $4f(2) - g(2)$?

A. -5

B. 1

C. 22

D. 28

Question ID 113b938e

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■□

ID: 113b938e

$y = 18 - 5x$

The equation above represents the speed y, in feet per second, of Sheila's bicycle x seconds after she applied the brakes at the end of a ride. If the equation is graphed in the xy-plane, which of the following is the best interpretation of the x-coordinate of the line's x-intercept in the context of the problem?

A. The speed of Sheila's bicycle, in feet per second, before Sheila applied the brakes

B. The number of feet per second the speed of Sheila's bicycle decreased each second after Sheila applied the brakes

C. The number of seconds it took from the time Sheila began applying the brakes until the bicycle came to a complete stop

D. The number of feet Sheila's bicycle traveled from the time she began applying the brakes until the bicycle came to a complete stop

Question ID 441558e7

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■□

ID: 441558e7

Scientists collected fallen acorns that each housed a colony of the ant species *P. ohioensis* and analyzed each colony's structure. For any of these colonies, if the colony has x worker ants, the equation $y = 0.67x + 2.6$, where $20 \leq x \leq 110$, gives the predicted number of larvae, y, in the colony. If one of these colonies has 58 worker ants, which of the following is closest to the predicted number of larvae in the colony?

A. 41

B. 61

C. 83

D. 190

Question ID 8a6de407

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■□

ID: 8a6de407

The function *f* is defined by $f(x) = mx + b$, where *m* and *b* are constants. If $f(0) = 18$ and $f(1) = 20$, what is the value of *m* ?

Question ID 41fdc0b8

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■□

ID: 41fdc0b8

Population of Greenleaf, Idaho

Year	Population
2000	862
2010	846

The table above shows the population of Greenleaf, Idaho, for the years 2000 and 2010. If the relationship between population and year is linear, which of the following functions P models the population of Greenleaf t years after 2000?

A. $P(t) = 862 - 1.6t$

B. $P(t) = 862 - 16t$

C. $P(t) = 862 + 16(t - 2{,}000)$

D. $P(t) = 862 - 1.6(t - 2{,}000)$

Question ID 2b15d65f

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■■

ID: 2b15d65f

An economist modeled the demand Q for a certain product as a linear function of the selling price P. The demand was 20,000 units when the selling price was $40 per unit, and the demand was 15,000 units when the selling price was $60 per unit. Based on the model, what is the demand, in units, when the selling price is $55 per unit?

A. 16,250

B. 16,500

C. 16,750

D. 17,500

Question ID be9cb6a2

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■■

ID: be9cb6a2

The cost of renting a backhoe for up to 10 days is $\$270$ for the first day and $\$135$ for each additional day. Which of the following equations gives the cost y, in dollars, of renting the backhoe for x days, where x is a positive integer and $x \leq 10$?

A. $y = 270x - 135$

B. $y = 270x + 135$

C. $y = 135x + 270$

D. $y = 135x + 135$

Question ID b988eeec

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■■

ID: b988eeec

The functions f and g are defined as $f(x) = \frac{1}{4}x - 9$ and $g(x) = \frac{3}{4}x + 21$. If the function h is defined as $h(x) = f(x) + g(x)$, what is the x-coordinate of the x-intercept of the graph of $y = h(x)$ in the xy-plane?

Question ID af2ba762

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■■

ID: af2ba762

According to data provided by the US Department of Energy, the average price per gallon of regular gasoline in the United States from September 1, 2014, to December 1, 2014, is modeled by the function F defined below, where $F(x)$ is the average price per gallon x months after September 1.

$F(x) = 2.74 - 0.19(x - 3)$

The constant 2.74 in this function estimates which of the following?

A. The average monthly decrease in the price per gallon

B. The difference in the average price per gallon from September 1, 2014, to December 1, 2014

C. The average price per gallon on September 1, 2014

D. The average price per gallon on December 1, 2014

Question ID 16889ef3

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■■

ID: 16889ef3

Oil and gas production in a certain area dropped from 4 million barrels in 2000 to 1.9 million barrels in 2013. Assuming that the oil and gas production decreased at a constant rate, which of the following linear functions *f* best models the production, in millions of barrels, *t* years after the year 2000?

A. $f(t) = \frac{21}{130}t + 4$

B. $f(t) = \frac{19}{130}t + 4$

C. $f(t) = -\frac{21}{130}t + 4$

D. $f(t) = -\frac{19}{130}t + 4$

Question ID 6989c80a

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■■

ID: 6989c80a

$$F(x) = \frac{9}{5}(x - 273.15) + 32$$

The function F gives the temperature, in degrees Fahrenheit, that corresponds to a temperature of x kelvins. If a temperature increased by 2.10 kelvins, by how much did the temperature increase, in degrees Fahrenheit?

A. 3.78

B. 35.78

C. 487.89

D. 519.89

Question ID 78391fcc

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■■

ID: 78391fcc

x	-11	-10	-9	-8
$f(x)$	21	18	15	12

The table above shows some values of x and their corresponding values $f(x)$ for the linear function f. What is the x-intercept of the graph of $y = f(x)$ in the xy-plane?

A. $(-3,0)$

B. $(-4,0)$

C. $(-9,0)$

D. $(-12,0)$

Question ID a04050d8

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■■

ID: a04050d8

Energy per Gram of Typical Macronutrients

Macronutrient	Food calories	Kilojoules
Protein	4.0	16.7
Fat	9.0	37.7
Carbohydrate	4.0	16.7

The table above gives the typical amounts of energy per gram, expressed in both food calories and kilojoules, of the three macronutrients in food. If the 180 food calories in a granola bar come entirely from p grams of protein, f grams of fat, and c grams of carbohydrate, which of the following expresses f in terms of p and c ?

A. $f = 20 + \frac{4}{9}(p + c)$

B. $f = 20 - \frac{4}{9}(p + c)$

C. $f = 20 - \frac{4}{9}(p - c)$

D. $f = 20 + \frac{9}{4}(p + c)$

Question ID daad7c32

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■■

ID: daad7c32

An object hangs from a spring. The formula $\ell = 30 + 2w$ relates the length ℓ, in centimeters, of the spring to the weight w, in newtons, of the object.

Which of the following describes the meaning of the 2 in this context?

A. The length, in centimeters, of the spring with no weight attached

B. The weight, in newtons, of an object that will stretch the spring 30 centimeters

C. The increase in the weight, in newtons, of the object for each one-centimeter increase in the length of the spring

D. The increase in the length, in centimeters, of the spring for each one-newton increase in the weight of the object

Question ID 023c0a8d

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	■■■

ID: 023c0a8d

For the function *f*, if $f(3x) = x - 6$ for all values of *x*, what is the value of $f(6)$?

A. -6

B. -4

C. 0

D. 2