Question ID dadfd136

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: dadfd136

In the linear function h, $h(0) = 41$ and $h(1) = 40$. Which equation defines h?

A. $h(x) = -x + 41$

B. $h(x) = -x$

C. $h(x) = -41x$

D. $h(x) = -41$

ID: dadfd136 Answer

Correct Answer: A

Rationale

Choice A is correct. An equation defining a linear function can be written in the form $h(x) = ax + b$, where a and b are constants. It's given that $h(0) = 41$. Substituting 0 for x and 41 for $h(x)$ in the equation $h(x) = ax + b$ yields $41 = a(0) + b$, or $b = 41$. Substituting 41 for b in the equation $h(x) = ax + b$ yields $h(x) = ax + 41$. It's also given that $h(1) = 40$. Substituting 1 for x and 40 for $h(x)$ in the equation $h(x) = ax + 41$ yields $40 = a(1) + 41$, or $40 = a + 41$. Subtracting 41 from the left- and right-hand sides of this equation yields $-1 = a$. Substituting -1 for a in the equation $h(x) = ax + 41$ yields $h(x) = -1x + 41$, or $h(x) = -x + 41$.

Choice B is incorrect. Substituting 0 for x and 41 for $h(x)$ in this equation yields $41 = -0$, which isn't a true statement.

Choice C is incorrect. Substituting 0 for x and 41 for $h(x)$ in this equation yields $41 = -41(0)$, or $41 = 0$, which isn't a true statement.

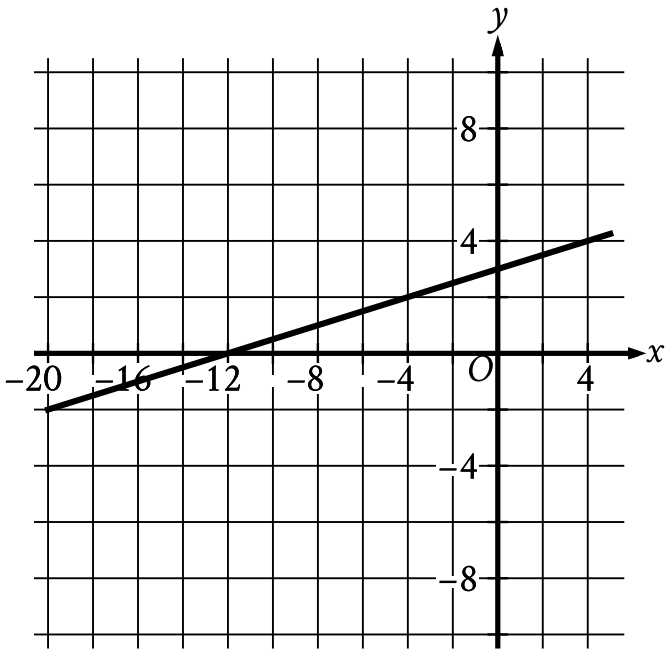
Choice D is incorrect. Substituting 41 for $h(x)$ in this equation yields $41 = -41$, which isn't a true statement.

Question Difficulty: Easy

Question ID a54038fb

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: a54038fb



The graph of the linear function f is shown, where $y = f(x)$. What is the *x*-intercept of the graph of f?

A. $(-12, 0)$

B. $(0, 0)$

C. $(\frac{1}{4}, 0)$

D. $(12, 0)$

ID: a54038fb Answer

Correct Answer: A

Rationale

Choice A is correct. The *x*-intercept of a graph is the point where the graph intersects the *x*-axis. The graph of function f, where $y = f(x)$, intersects the *x*-axis at $(-12, 0)$. Therefore, the *x*-intercept of the graph of f is $(-12, 0)$.

Choice B 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 366854ef

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 366854ef

$$f(x) = x + \frac{8}{11}$$

The function f is defined by the given equation. What is the value of $f(x)$ when $x = \frac{3}{11}$?

ID: 366854ef Answer

Correct Answer: 1

Rationale

The correct answer is 1. It's given that the function f is defined by $f(x) = x + \frac{8}{11}$. Substituting $\frac{3}{11}$ for x in the given function yields $f\left(\frac{3}{11}\right) = \frac{3}{11} + \frac{8}{11}$, which gives $f\left(\frac{3}{11}\right) = \frac{11}{11}$, or $f\left(\frac{3}{11}\right) = 1$. Therefore, when $x = \frac{3}{11}$, the value of $f(x)$ is 1.

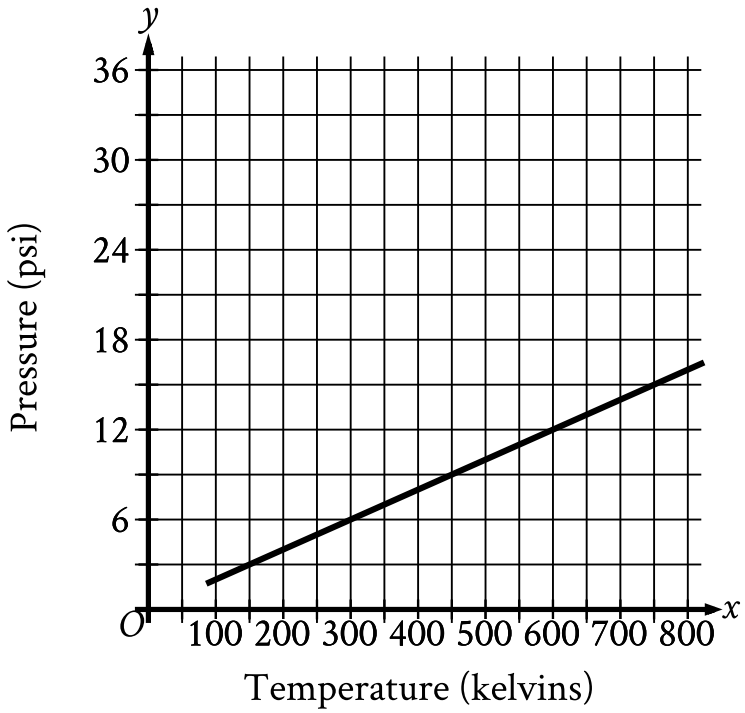
Question Difficulty: Easy

Question ID 567984fc

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 567984fc

Argon is placed inside a container with a constant volume. The graph shows the estimated pressure y, in pounds per square inch (psi), of the argon when its temperature is x kelvins.



What is the estimated pressure of the argon, in psi, when the temperature is 600 kelvins?

A. 6

B. 12

C. 300

D. 600

ID: 567984fc Answer

Correct Answer: B

Rationale

Choice B is correct. For the graph shown, the x-axis represents temperature, in kelvins, and the y-axis represents the estimated pressure, in pounds per square inch (psi). The estimated pressure of the argon when the temperature is 600 kelvins can be found by locating the point on the graph where the value of x is equal to 600. The graph passes through the point $(600, 12)$. This means that when the temperature is 600 kelvins, the estimated pressure is 12 psi.

Choice A is incorrect. This is the estimated pressure, in psi, of the argon when the temperature is 300 kelvins, not 600 kelvins.

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

Choice D is incorrect. This is the temperature, in kelvins, of the argon.

Question Difficulty: Easy

Question ID 4c195508

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 4c195508

$$d = 16t$$

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.

ID: 4c195508 Answer

Correct Answer: C

Rationale

Choice C is correct. It's given that in the equation $d = 16t$, d represents the distance, in inches, and t represents the number of seconds since an object started moving. In this equation, t is being multiplied by 16. This means that the object's distance increases by 16 inches each second. Therefore, the best interpretation of 16 in this context is that the object is moving at a rate of 16 inches per second.

Choice A is incorrect and may result from conceptual errors.

Choice B is incorrect. This is the best interpretation of $16t$, rather than 16, in this context.

Choice D is incorrect and may result from conceptual errors.

Question Difficulty: Easy

Question ID 19d890da

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 19d890da

$$d = 16 - \frac{x}{30}$$

The equation shown gives the estimated amount of diesel d, in gallons, that remains in the gas tank of a truck after being driven x miles, where $0 \leq x \leq 480$. What is the estimated amount of diesel, in gallons, that remains in the gas tank of the truck when $x = 300$?

A. 0

B. 6

C. 14

D. 16

ID: 19d890da Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that the equation $d = 16 - \frac{x}{30}$ gives the estimated amount of diesel d, in gallons, that remains in the gas tank of the truck after being driven x miles. Substituting 300 for x in the given equation yields $d = 16 - \frac{300}{30}$, which is equivalent to $d = 16 - 10$, or $d = 6$. Therefore, the estimated amount of diesel that remains in the gas tank of the truck when $x = 300$ is 6 gallons.

Choice A is incorrect. This is the estimated amount of diesel, in gallons, that will remain in the gas tank of the truck when $x = 480$, not when $x = 300$.

Choice C is incorrect. This is the estimated amount of diesel, in gallons, that will remain in the gas tank of the truck when $x = 60$, not when $x = 300$.

Choice D is incorrect. This is the estimated amount of diesel, in gallons, that will remain in the gas tank of the truck when $x = 0$, not when $x = 300$.

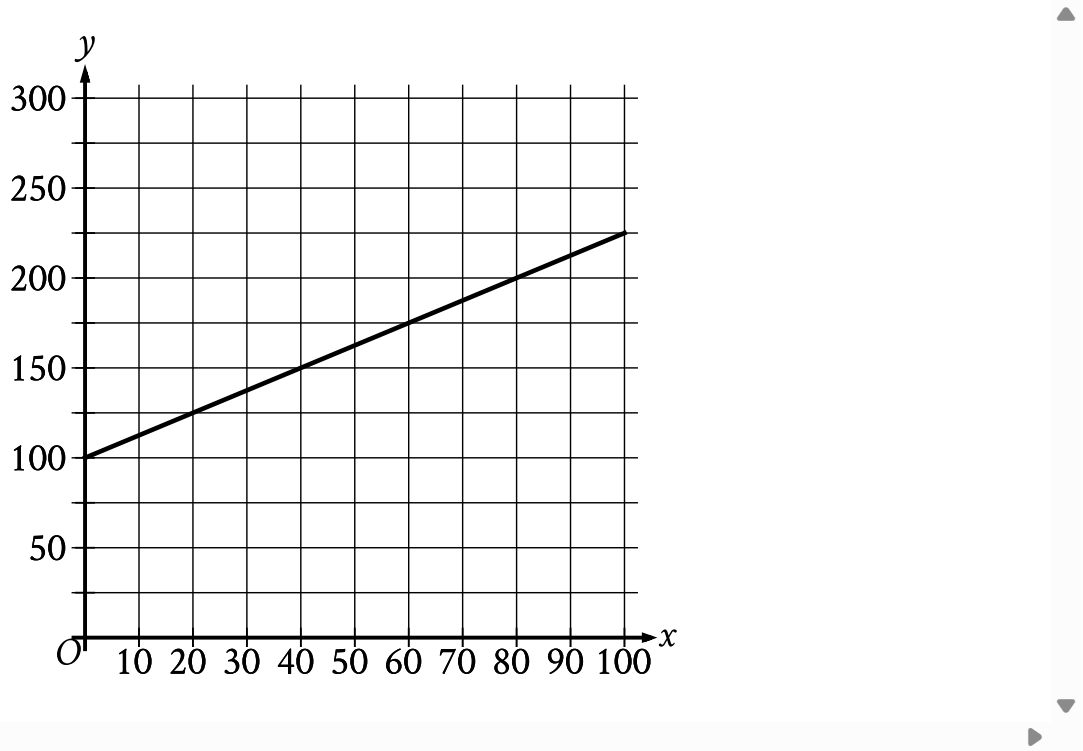
Question Difficulty: Easy

Question ID cab69050

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: cab69050

The cost y, in dollars, for a manufacturer to make x rings is represented by the line shown.



What is the cost, in dollars, for the manufacturer to make 60 rings?

A. 100

B. 125

C. 175

D. 225

ID: cab69050 Answer

Correct Answer: C

Rationale

Choice C is correct. The line shown represents the cost y, in dollars, for a manufacturer to make x rings. For the line shown, the x-axis represents the number of rings made by the manufacturer and the y-axis represents the cost, in dollars. Therefore, the cost, in dollars, for the manufacturer to make 60 rings is represented by the y-coordinate of the point on the line that has an x-coordinate of 60. The point on the line with an x-coordinate of 60 has a y-coordinate of 175. Therefore, the cost, in dollars, for the manufacturer to make 60 rings is 175.

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

Choice B is incorrect. This is the cost, in dollars, for the manufacturer to make 20 rings.

Choice D is incorrect. This is the cost, in dollars, for the manufacturer to make 100 rings.

Question Difficulty: Easy

Question ID 15048ba2

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 15048ba2

The function f is defined by $f(x) = 3x - 8$. What is the value of $f(7)$?

A. 29

B. 13

C. -5

D. -29

ID: 15048ba2 Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that the function f is defined by $f(x) = 3x - 8$. The value of $f(7)$ is the value of $f(x)$ when $x = 7$. Substituting 7 for x in the given equation yields $f(7) = 3(7) - 8$, which is equivalent to $f(7) = 21 - 8$, or $f(7) = 13$.

Choice A is incorrect. This is the value of $f(7)$ when $f(x) = 3x + 8$, rather than $f(x) = 3x - 8$.

Choice C is incorrect. This is the value of $f(1)$, rather than $f(7)$.

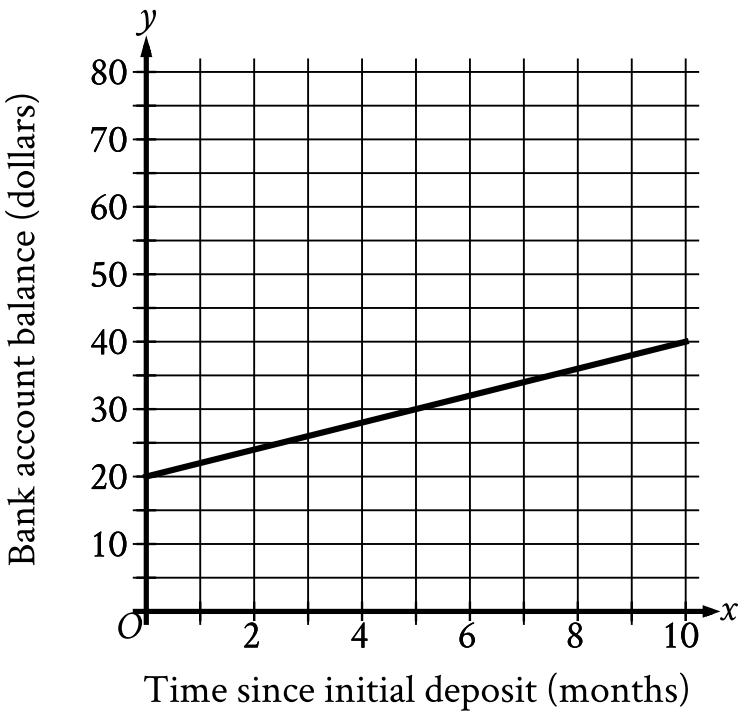
Choice D is incorrect. This is the value of $f(-7)$, rather than $f(7)$.

Question Difficulty: Easy

Question ID 79354b8a

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 79354b8a



A bank account was opened with an initial deposit. Over the next several months, regular deposits were made into this account, and there were no withdrawals made during this time. The graph of the function f shown, where $y = f(x)$, estimates the account balance, in dollars, in this bank account x months since the initial deposit. To the nearest whole dollar, what is the amount of the initial deposit estimated by the graph?

ID: 79354b8a Answer

Correct Answer: 20

Rationale

The correct answer is 20. For the graph shown, the *x*-axis represents the time since the initial deposit, in months, and the *y*-axis represents the bank account balance, in dollars. The amount of the initial deposit is estimated by the *y*-coordinate of the point on the graph that represents 0 months since the initial deposit. Therefore, the amount of the initial deposit is estimated by the corresponding *y*-value for the point when $x = 0$. When $x = 0$, it is estimated that $y = 20$. Thus, the amount of the initial deposit estimated by the graph, to the nearest whole dollar, is 20.

Question Difficulty: Easy

Question ID dd381f21

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: dd381f21

The function f is defined by $f(x) = 80 - 6x$. What is the value of $f(7)$?

A. 13

B. 38

C. 74

D. 81

ID: dd381f21 Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that function f is defined by $f(x) = 80 - 6x$. The value of $f(7)$ can be found by substituting 7 for x in the given function, which yields $f(7) = 80 - 6(7)$, or $f(7) = 80 - 42$, which is equivalent to $f(7) = 38$. Therefore, the value of $f(7)$ is 38.

Choice A is incorrect. This is the value of $80 - 67$, not $80 - 6(7)$.

Choice C is incorrect. This is the value of $80 - 6(1)$, not $80 - 6(7)$.

Choice D is incorrect. This is the value of $80 - 6 + 7$, not $80 - 6(7)$.

Question Difficulty: Easy

Question ID 59872b80

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 59872b80

The function g is defined by $g(x) = 10x + 8$. What is the value of $g(x)$ when $x = 8$?

A. 0

B. 8

C. 10

D. 88

ID: 59872b80 Answer

Correct Answer: D

Rationale

Choice D is correct. The value of $g(x)$ when $x = 8$ can be found by substituting 8 for x in the given equation $g(x) = 10x + 8$. This yields $g(8) = 10(8) + 8$, or $g(8) = 88$. Therefore, when $x = 8$, the value of $g(x)$ is 88.

Choice A is incorrect. This is the value of x when $g(x) = 8$, rather than the value of $g(x)$ when $x = 8$.

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: Easy

Question ID d2205c27

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: d2205c27

$$f(x) = x + b$$

For the linear function f, b is a constant. When $x = 0$, $f(x) = 30$. What is the value of b?

A. -30

B. $-\frac{1}{30}$

C. $\frac{1}{30}$

D. 30

ID: d2205c27 Answer

Correct Answer: D

Rationale

Choice D is correct. It's given that when $x = 0$, $f(x) = 30$. Substituting 0 for x and 30 for $f(x)$ in the given function yields $30 = 0 + b$, or $30 = b$. Therefore, the value of b is 30.

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: Easy

Question ID 2e5d2643

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 2e5d2643

$$f(x) = 8x + 4$$

The function f gives the estimated height, in feet, of a willow tree x years after its height was first measured. Which statement is the best interpretation of 4 in this context?

A. The tree will be measured each year for 4 years.

B. The tree is estimated to grow to a maximum height of 4 feet.

C. The estimated height of the tree increased by 4 feet each year.

D. The estimated height of the tree was 4 feet when it was first measured.

ID: 2e5d2643 Answer

Correct Answer: D

Rationale

Choice D is correct. It's given that the function $f(x) = 8x + 4$ gives the estimated height, in feet, of a willow tree x years after its height was first measured. For a function defined by an equation of the form $f(x) = mx + b$, where m and b are constants, b represents the value of $f(x)$ when $x = 0$. It follows that in the given function, 4 represents the value of $f(x)$ when $x = 0$. Therefore, the best interpretation of 4 in this context is that the estimated height of the tree was 4 feet when it was first measured.

Choice A is incorrect and may result from conceptual errors.

Choice B is incorrect and may result from conceptual errors.

Choice C is incorrect and may result from conceptual errors.

Question Difficulty: Easy

Question ID fe4d899b

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: fe4d899b

For the linear function f, the graph of $y = f(x)$ in the *xy*-plane has a slope of $\frac{1}{4}$ and passes through the point $(0, 5)$. Which equation defines f?

A. $f(x) = \frac{1}{4}x + 5$

B. $f(x) = \frac{1}{4}x + \frac{1}{5}$

C. $f(x) = \frac{1}{4}x - \frac{5}{4}$

D. $f(x) = \frac{1}{4}x - 5$

ID: fe4d899b Answer

Correct Answer: A

Rationale

Choice A is correct. An equation that defines a linear function f can be written in the form $f(x) = mx + b$, where m is the slope of the graph of $y = f(x)$ in the *xy*-plane and $(0, b)$ is the *y*-intercept of the graph. It's given that for the linear function f, the graph of $y = f(x)$ in the *xy*-plane has a slope of $\frac{1}{4}$. Therefore, $m = \frac{1}{4}$. It's also given that the graph of $y = f(x)$ passes through the point $(0, 5)$. Therefore, the *y*-intercept of the graph is $(0, 5)$, and it follows that $b = 5$. Substituting $\frac{1}{4}$ for m and 5 for b in the equation $f(x) = mx + b$ yields $f(x) = \frac{1}{4}x + 5$.

Choice B is incorrect. This equation defines a function whose graph has a *y*-intercept of $(0, \frac{1}{5})$, not $(0, 5)$.

Choice C is incorrect. This equation defines a function whose graph has a *y*-intercept of $(0, -\frac{5}{4})$, not $(0, 5)$.

Choice D is incorrect. This equation defines a function whose graph has a *y*-intercept of $(0, -5)$, not $(0, 5)$.

Question Difficulty: Easy

Question ID 7b689995

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 7b689995

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

ID: 7b689995 Answer

Correct Answer: A

Rationale

Choice A is correct. The value of $h(-2)$ can be found by substituting -2 for x in the equation defining h. Substituting -2 for x in $h(x) = 3x - 7$ yields $h(-2) = 3(-2) - 7$, or $h(-2) = -13$. Therefore, the value of $h(-2)$ is -13.

Choice B is incorrect. This is the value of $h(-1)$, not $h(-2)$.

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 1c4f9da2

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 1c4f9da2

For the linear function f, $f(0) = 17$ and $f(1) = 17$. Which equation defines f?

A. $f(x) = \frac{1}{17}$

B. $f(x) = 1$

C. $f(x) = 17$

D. $f(x) = 34$

ID: 1c4f9da2 Answer

Correct Answer: C

Rationale

Choice C is correct. An equation defining the linear function f can be written in the form $f(x) = mx + b$, where m is the slope and $(0, b)$ is the *y*-intercept of the graph of $y = f(x)$ in the *xy*-plane. The slope of the graph of $y = f(x)$ can be found using the formula $m = \frac{y_2 - y_1}{x_2 - x_1}$, where (x_1, y_1) and (x_2, y_2) are any two points that the graph passes through. If $f(0) = 17$, it follows that the graph of $y = f(x)$ passes through the point $(0, 17)$. If $f(1) = 17$, it follows that the graph of $y = f(x)$ passes through the point $(1, 17)$. Substituting $(0, 17)$ and $(1, 17)$ for (x_1, y_1) and (x_2, y_2), respectively, in the formula $m = \frac{y_2 - y_1}{x_2 - x_1}$ yields $m = \frac{17 - 17}{1 - 0}$, which is equivalent to $m = \frac{0}{1}$, or $m = 0$. Since the graph of $y = f(x)$ passes through $(0, 17)$, it follows that $b = 17$. Substituting 0 for m and 17 for b in the equation $f(x) = mx + b$ yields $f(x) = 0x + 17$, or $f(x) = 17$. Thus, the equation that defines f is $f(x) = 17$.

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

Question Difficulty: Easy

Question ID c41e64a3

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: c41e64a3

$$f(x) = 7x + 1$$

The function gives the total number of people on a company retreat with x managers. What is the total number of people on a company retreat with 7 managers?

ID: c41e64a3 Answer

Correct Answer: 50

Rationale

The correct answer is 50. It's given that the function f gives the total number of people on a company retreat with x managers. It's also given that 7 managers are on the company retreat. Substituting 7 for x in the given function yields $f(7) = 7(7) + 1$, or $f(7) = 50$. Therefore, there are a total of 50 people on a company retreat with 7 managers.

Question Difficulty: Easy

Question ID 827504df

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 827504df

If $y = 5x + 10$, what is the value of y when $x = 8$?

ID: 827504df Answer

Correct Answer: 50

Rationale

The correct answer is 50. Substituting 8 for x in the given equation yields $y = 5(8) + 10$, or $y = 50$. Therefore, the value of y is 50 when $x = 8$.

Question Difficulty: Easy

Question ID 8235f2ed

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 8235f2ed

x	$f(x)$
0	29
1	32
2	35

For the linear function f, the table shows three values of x and their corresponding values of $f(x)$. Which equation defines $f(x)$?

A. $f(x) = 3x + 29$

B. $f(x) = 29x + 32$

C. $f(x) = 35x + 29$

D. $f(x) = 32x + 35$

ID: 8235f2ed Answer

Correct Answer: A

Rationale

Choice A is correct. An equation that defines a linear function f can be written in the form $f(x) = mx + b$, where m and b are constants. It's given in the table that when $x = 0$, $f(x) = 29$. Substituting 0 for x and 29 for $f(x)$ in the equation $f(x) = mx + b$ yields $29 = m(0) + b$, or $29 = b$. Substituting 29 for b in the equation $f(x) = mx + b$ yields $f(x) = mx + 29$. It's also given in the table that when $x = 1$, $f(x) = 32$. Substituting 1 for x and 32 for $f(x)$ in the equation $f(x) = mx + 29$ yields $32 = m(1) + 29$, or $32 = m + 29$. Subtracting 29 from both sides of this equation yields $3 = m$. Substituting 3 for m in the equation $f(x) = mx + 29$ yields $f(x) = 3x + 29$.

Choice B 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 468f320e

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 468f320e

Hana deposited a fixed amount into her bank account each month. The function $f(t) = 100 + 25t$ gives the amount, in dollars, in Hana's bank account after t monthly deposits. What is the best interpretation of 25 in this context?

A. With each monthly deposit, the amount in Hana's bank account increased by $\$25$.

B. Before Hana made any monthly deposits, the amount in her bank account was $\$25$.

C. After 1 monthly deposit, the amount in Hana's bank account was $\$25$.

D. Hana made a total of 25 monthly deposits.

ID: 468f320e Answer

Correct Answer: A

Rationale

Choice A is correct. It's given that t represents the number of monthly deposits. In the given function $f(t) = 100 + 25t$, the coefficient of t is 25. This means that for every increase in the value of t by 1, the value of $f(t)$ increases by 25. It follows that with each monthly deposit, the amount in Hana's bank account increased by $\$25$.

Choice B is incorrect. Before Hana made any monthly deposits, the amount in her bank account was $\$100$.

Choice C is incorrect. After 1 monthly deposit, the amount in Hana's bank account was $\$125$.

Choice D is incorrect and may result from conceptual errors.

Question Difficulty: Easy

Question ID 49dc0f69

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 49dc0f69

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

ID: 49dc0f69 Answer

Correct Answer: D

Rationale

Choice D is correct. Substituting 9 for x in the given equation yields $f(9) = 100(9) + 2$, or $f(9) = 902$. Therefore, the value of $f(x)$ when $x = 9$ is 902.

Choice A is incorrect. This is the value of $f(x)$ when $x = 1.09$.

Choice B is incorrect. This is the value of $f(x)$ when $x = 1.16$.

Choice C is incorrect. This is the value of $f(x)$ when $x = 8.98$.

Question Difficulty: Easy

Question ID a5ed4369

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: a5ed4369

The function f is defined by $f(x) = 8x$. For what value of x does $f(x) = 72$?

A. 8

B. 9

C. 64

D. 80

ID: a5ed4369 Answer

Correct Answer: B

Rationale

Choice B is correct. Substituting 72 for $f(x)$ in the given function yields $72 = 8x$. Dividing each side of this equation by 8 yields $9 = x$. Therefore, $f(x) = 72$ when the value of x is 9.

Choice A is incorrect. This is the value of x for which $f(x) = 64$, not $f(x) = 72$.

Choice C is incorrect. This is the value of x for which $f(x) = 512$, not $f(x) = 72$.

Choice D is incorrect. This is the value of x for which $f(x) = 640$, not $f(x) = 72$.

Question Difficulty: Easy

Question ID a400ddb4

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: a400ddb4

A contract for a certain service requires a onetime activation cost of $\$35$ and a monthly cost of $\$23$. Which equation represents this situation, where c is the total cost, in dollars, of this service contract for t months?

A. $c = \frac{t}{23} + 35$

B. $c = \frac{t}{35} + 23$

C. $c = 23t + 35$

D. $c = 35t + 23$

ID: a400ddb4 Answer

Correct Answer: C

Rationale

Choice C is correct. It's given that this service contract requires a monthly cost of $\$23$. A monthly cost of $\$23$ for t months results in a cost of $\$23t$. It's also given that this service contract requires a onetime activation cost of $\$35$. Adding the onetime activation cost to the monthly cost of the service contract for t months yields the total cost c, in dollars, of this service contract for t months. Therefore, this situation can be represented by the equation $c = 23t + 35$.

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

Question Difficulty: Easy

Question ID 1f976ac6

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 1f976ac6

The function f is defined by $f(x) = -3x + 60$. What is the value of $f(x)$ when $x = -8$?

A. 49

B. 52

C. 57

D. 84

ID: 1f976ac6 Answer

Correct Answer: D

Rationale

Choice D is correct. The value of $f(x)$ when $x = -8$ can be found by substituting -8 for x in the given function. This yields $f(-8) = -3(-8) + 60$, or $f(-8) = 84$. Therefore, when $x = -8$, the value of $f(x)$ is 84.

Choice A is incorrect. This is the value of $(-3 + (-8)) + 60$, not $-3(-8) + 60$.

Choice B is incorrect. This is the value of $-8 + 60$, not $-3(-8) + 60$.

Choice C is incorrect. This is the value of $-3 + 60$, not $-3(-8) + 60$.

Question Difficulty: Easy

Question ID 07792154

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 07792154

For the linear function f, the graph of $y = f(x)$ in the *xy*-plane has a slope of 39 and passes through the point $(0, 0)$. Which equation defines f?

A. $f(x) = -39x$

B. $f(x) = \frac{1}{39}x$

C. $f(x) = x - 39$

D. $f(x) = 39x$

ID: 07792154 Answer

Correct Answer: D

Rationale

Choice D is correct. An equation defining a linear function can be written in the form $f(x) = mx + b$, where m is the slope and $(0, b)$ is the *y*-intercept of the graph of $y = f(x)$ in the *xy*-plane. It's given that the graph of $y = f(x)$ has a slope of 39, so $m = 39$. It's also given that the graph of $y = f(x)$ passes through the point $(0, 0)$, so $b = 0$. Substituting 39 for m and 0 for b in $f(x) = mx + b$ yields $f(x) = 39x + 0$, or $f(x) = 39x$. Thus, the equation that defines f is $f(x) = 39x$.

Choice A is incorrect. This equation defines a function whose graph has a slope of -39, not 39.

Choice B is incorrect. This equation defines a function whose graph has a slope of $\frac{1}{39}$, not 39.

Choice C is incorrect. This equation defines a function whose graph has a slope of 1, not 39, and passes through the point $(0, -39)$, not $(0, 0)$.

Question Difficulty: Easy

Question ID 630514d2

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 630514d2

Gabriella deposits $\$35$ in a savings account at the end of each week. At the beginning of the 1st week of a year there was $\$600$ in that savings account. How much money, in dollars, will be in the account at the end of the 4th week of that year?

A. 460

B. 635

C. 639

D. 740

ID: 630514d2 Answer

Correct Answer: D

Rationale

Choice D is correct. It's given that at the beginning of the 1st week of the year there was $\$600$ in a savings account and Gabriella deposits $\$35$ in that savings account at the end of each week. Therefore, the amount of money, in dollars, in the savings account at the end of the 4th week of that year is $600 + 4(35)$, or 740.

Choice A is incorrect. This is the amount of money, in dollars, that will be in the account at the end of the 4th week if Gabriella withdraws, rather than deposits, $\$35$ at the end of each week.

Choice B is incorrect. This is the amount of money, in dollars, that will be in the account at the end of the 1st week, not the 4th week.

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

Question Difficulty: Easy

Question ID f3d88453

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: f3d88453

For the linear function f, the graph of $y = f(x)$ in the *xy*-plane has a slope of 2 and has a *y*-intercept at $(0, -5)$. Which equation defines f?

A. $f(x) = \frac{1}{2}x - 5$

B. $f(x) = -\frac{1}{2}x - 5$

C. $f(x) = -2x - 5$

D. $f(x) = 2x - 5$

ID: f3d88453 Answer

Correct Answer: D

Rationale

Choice D is correct. An equation defining the linear function f can be written in the form $f(x) = mx + b$, where m is the slope and $(0, b)$ is the *y*-intercept of the graph of $y = f(x)$ in the *xy*-plane. It's given that the graph of $y = f(x)$ has a slope of 2. Therefore, $m = 2$. It's also given that the graph of $y = f(x)$ has a *y*-intercept at $(0, -5)$. Therefore, $b = -5$. Substituting 2 for m and -5 for b in the equation $f(x) = mx + b$ yields $f(x) = 2x - 5$. Thus, the equation that defines f is $f(x) = 2x - 5$.

Choice A is incorrect. For this function, the graph of $y = f(x)$ in the *xy*-plane has a slope of $\frac{1}{2}$, not 2.

Choice B is incorrect. For this function, the graph of $y = f(x)$ in the *xy*-plane has a slope of $-\frac{1}{2}$, not 2.

Choice C is incorrect. For this function, the graph of $y = f(x)$ in the *xy*-plane has a slope of -2, not 2.

Question Difficulty: Easy

Question ID ca4cf555

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: ca4cf555

As part of a science project on evaporation, Amaya measured the height of a liquid in a container over a period of time. The function $f(x) = 33 - 0.18x$ gives the estimated height, in centimeters (cm), of the liquid in the container x days after the start of the project. Which of the following is the best interpretation of 33 in this context?

A. The estimated height, in cm, of the liquid at the start of the project

B. The estimated height, in cm, of the liquid at the end of the project

C. The estimated change in the height, in cm, of the liquid each day

D. The estimated number of days for all of the liquid to evaporate

ID: ca4cf555 Answer

Correct Answer: A

Rationale

Choice A is correct. It's given that the function $f(x) = 33 - 0.18x$ gives the estimated height, in centimeters (cm), of the liquid in the container x days after the start of the project. For a linear function in the form $f(x) = a + bx$, where a and b are constants, a represents the value of $f(0)$ and b represents the rate of change of the function. It follows that in the given function, 33 represents the value of $f(0)$. Therefore, the best interpretation of 33 in this context is the estimated height, in cm, of the liquid at the start of the project.

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

Choice C is incorrect. The estimated change in the height, in cm, of the liquid each day is 0.18, not 33.

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

Question Difficulty: Easy

Question ID 109036d5

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 109036d5

The function f is defined by the equation $f(x) = 7x + 2$. What is the value of $f(x)$ when $x = 4$?

ID: 109036d5 Answer

Correct Answer: 30

Rationale

The correct answer is 30. The value of $f(x)$ when $x = 4$ can be found by substituting 4 for x in the given equation $f(x) = 7x + 2$. This yields $f(4) = 7(4) + 2$, or $f(4) = 30$. Therefore, when $x = 4$, the value of $f(x)$ is 30.

Question Difficulty: Easy

Question ID bc6c6829

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: bc6c6829

Area (square feet)	Water (gallons)
2,520	4,536
3,780	6,804
5,040	9,072

The buildings of a shopping center are designed to allow water to drain from the roof into gutters on the sides of the buildings. The table shows the relationship between the area x, in square feet, of a roof and the amount of water $f(x)$, in gallons, drained from the roof into the gutters over a certain period of time. Which equation could define f?

A. $f(x) = 0.6x$

B. $f(x) = 1.8x$

C. $f(x) = 2{,}268x$

D. $f(x) = 4{,}536x$

ID: bc6c6829 Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that the table represents the relationship between the area x, in square feet, of the roof of a shopping center and the amount of water $f(x)$, in gallons, drained from the roof into the gutters. Every choice represents this relationship with an equation defining f in the form $f(x) = mx$, where m is a constant rate of change. The value of m can be determined by dividing both sides of the equation by x. Each of three pairs of x and $f(x)$ in the table yield $m = 1.8$, since $\frac{4{,}536}{2{,}520} = 1.8$, $\frac{6{,}804}{3{,}780} = 1.8$, and $\frac{9{,}072}{5{,}040} = 1.8$. Therefore, the equation $f(x) = 1.8x$ could define f.

Choice A is incorrect. For the roof with an area of $2{,}520$ square feet, this equation would yield $0.6(2{,}520)$, or $1{,}512$, gallons, not the $4{,}536$ gallons shown in the table.

Choice C is incorrect. For the roof with an area of $2{,}520$ square feet, this equation would yield $2{,}268(2{,}520)$, or $5{,}715{,}360$, gallons, not the $4{,}536$ gallons shown in the table.

Choice D is incorrect. For the roof with an area of $2{,}520$ square feet, this equation would yield $4{,}536(2{,}520)$, or $11{,}430{,}720$, gallons, not the $4{,}536$ gallons shown in the table.

Question Difficulty: Easy

Question ID 3b9a53e6

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 3b9a53e6

Sean rents a tent at a cost of $\$11$ per day plus a onetime insurance fee of $\$10$. Which equation represents the total cost c, in dollars, to rent the tent with insurance for d days?

A. $c = 11(d + 10)$

B. $c = 10(d + 11)$

C. $c = 11d + 10$

D. $c = 10d + 11$

ID: 3b9a53e6 Answer

Correct Answer: C

Rationale

Choice C is correct. It's given that the cost of renting a tent is $\$11$ per day for d days. Multiplying the rental cost by the number of days yields $\$11d$, which represents the cost of renting the tent for d days before the insurance is added. Adding the onetime insurance fee of $\$10$ to the rental cost of $\$11d$ gives the total cost c, in dollars, which can be represented by the equation $c = 11d + 10$.

Choice A is incorrect. This equation represents the total cost to rent the tent if the insurance fee was charged every day.

Choice B is incorrect. This equation represents the total cost to rent the tent if the daily fee was $\$(d + 11)$ for 10 days.

Choice D is incorrect. This equation represents the total cost to rent the tent if the daily fee was $\$10$ and the onetime fee was $\$11$.

Question Difficulty: Easy

Question ID 1ba10732

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 1ba10732

The total cost $f(x)$, in dollars, to lease a car for 36 months from a particular car dealership is given by $f(x) = 36x + 1{,}000$, where x is the monthly payment, in dollars. What is the total cost to lease a car when the monthly payment is $\$400$?

A. $\$13{,}400$

B. $\$13{,}000$

C. $\$15{,}400$

D. $\$37{,}400$

ID: 1ba10732 Answer

Correct Answer: C

Rationale

Choice C is correct. It's given that $f(x)$ is the total cost, in dollars, to lease a car from this dealership with a monthly payment of x dollars. Therefore, the total cost, in dollars, to lease the car when the monthly payment is $\$400$ is represented by the value of $f(x)$ when $x = 400$. Substituting 400 for x in the equation $f(x) = 36x + 1{,}000$ yields $f(400) = 36(400) + 1{,}000$, or $f(400) = 15{,}400$. Thus, when the monthly payment is $\$400$, the total cost to lease a car is $\$15{,}400$.

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

Question Difficulty: Easy

Question ID efec0cc4

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: efec0cc4

The function f is defined by $f(x) = \frac{1}{10}x - 2$. What is the *y*-intercept of the graph of $y = f(x)$ in the *xy*-plane?

A. $(-2, 0)$

B. $(0, -2)$

C. $(0, \frac{1}{10})$

D. $(\frac{1}{10}, 0)$

ID: efec0cc4 Answer

Correct Answer: B

Rationale

Choice B is correct. The *y*-intercept of the graph of a function in the *xy*-plane is the point on the graph where $x = 0$. It's given that $f(x) = \frac{1}{10}x - 2$. Substituting 0 for x in this equation yields $f(0) = \frac{1}{10}(0) - 2$, or $f(0) = -2$. Since it's given that $y = f(x)$, it follows that $y = -2$ when $x = 0$. Therefore, the *y*-intercept of the graph of $y = f(x)$ in the *xy*-plane is $(0, -2)$.

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 e9e0893d

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: e9e0893d

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. $y = 4.8x + 162$

ID: e9e0893d Answer

Correct Answer: D

Rationale

Choice D is correct. It's given that the length of the whale was 162 cm when it was born and that its length increased an average of 4.8 cm per month for the first 12 months after it was born. Since x represents the number of months after the whale was born, the total increase in the whale's length, in cm, is 4.8 times x, or $4.8x$. The length of the whale y, in cm, can be found by adding the whale's length at birth, 162 cm, to the total increase in length, $4.8x$ cm. Therefore, the equation that best represents this situation is $y = 4.8x + 162$.

Choice A is incorrect and may result from conceptual errors.

Choice B is incorrect and may result from conceptual errors.

Choice C is incorrect and may result from conceptual errors.

Question Difficulty: Easy

Question ID 2c082034

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 2c082034

The function f is defined by $f(x) = 25x + 30$. What is the value of $f(x)$ when $x = 2$?

A. 50

B. 57

C. 80

D. 110

ID: 2c082034 Answer

Correct Answer: C

Rationale

Choice C is correct. It's given that the function f is defined by $f(x) = 25x + 30$. Substituting 2 for x in this equation yields $f(2) = 25(2) + 30$, which is equivalent to $f(2) = 50 + 30$, or $f(2) = 80$. Therefore, the value of $f(x)$ is 80 when $x = 2$.

Choice A is incorrect. This is the value of $25(2)$, not $25(2) + 30$.

Choice B is incorrect. This is the value of $25 + 2 + 30$, not $25(2) + 30$.

Choice D is incorrect. This is the value of $(25 + 30)(2)$, not $25(2) + 30$.

Question Difficulty: Easy

Question ID 0afda795

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 0afda795

For the function f, the graph of $y = f(x)$ in the *xy*-plane has a slope of 3 and passes through the point $(0, -8)$. Which equation defines f?

A. $f(x) = 3x$

B. $f(x) = 3x - 8$

C. $f(x) = 3x + 5$

D. $f(x) = 3x + 11$

ID: 0afda795 Answer

Correct Answer: B

Rationale

Choice B is correct. An equation defining a linear function can be written in the form $f(x) = mx + b$, where m and b are constants, m is the slope of the graph of $y = f(x)$ in the *xy*-plane, and $(0, b)$ is the *y*-intercept of the graph. It's given that for the function f, the graph of $y = f(x)$ in the *xy*-plane has a slope of 3. Therefore, $m = 3$. It's also given that this graph passes through the point $(0, -8)$. Therefore, the *y*-intercept of the graph is $(0, -8)$, and it follows that $b = -8$. Substituting 3 for m and -8 for b in the equation $f(x) = mx + b$ yields $f(x) = 3x - 8$. Thus, the equation that defines f is $f(x) = 3x - 8$.

Choice A is incorrect. For this function, the graph of $y = f(x)$ in the *xy*-plane passes through the point $(0, 0)$, not $(0, -8)$.

Choice C is incorrect. For this function, the graph of $y = f(x)$ in the *xy*-plane passes through the point $(0, 5)$, not $(0, -8)$.

Choice D is incorrect. For this function, the graph of $y = f(x)$ in the *xy*-plane passes through the point $(0, 11)$, not $(0, -8)$.

Question Difficulty: Easy

Question ID 776fdbc4

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 776fdbc4

The function f is defined by $f(x) = 5x + 8$. For what value of x does $f(x) = 58$?

A. 10

B. 13

C. 50

D. 298

ID: 776fdbc4 Answer

Correct Answer: A

Rationale

Choice A is correct. It's given that the function f is defined by $f(x) = 5x + 8$. Substituting 58 for $f(x)$ in this equation yields $58 = 5x + 8$. Subtracting 8 from both sides of this equation yields $50 = 5x$. Dividing both sides of this equation by 5 yields $10 = x$. Therefore, the value of x when $f(x) = 58$ is 10.

Choice B 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. This is the value of $f(58)$, not the value of x when $f(x) = 58$.

Question Difficulty: Easy

Question ID 493bd7fa

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 493bd7fa

The function f defined by $f(t) = 14t + 9$ gives the estimated length, in inches, of a vine plant t months after Tavon purchased it. Which of the following is the best interpretation of 9 in this context?

A. Tavon will keep the vine plant for 9 months.

B. The vine plant is expected to grow 9 inches each month.

C. The vine plant is expected to grow to a maximum length of 9 inches.

D. The estimated length of the vine plant was 9 inches when Tavon purchased it.

ID: 493bd7fa Answer

Correct Answer: D

Rationale

Choice D is correct. It's given that the function f defined by $f(t) = 14t + 9$ gives the estimated length, in inches, of a vine plant t months after Tavon purchased it. For a function defined by an equation of the form $f(t) = mt + b$, where m and b are constants, b represents the value of $f(0)$, or the value of $f(t)$ when the value of t is 0. Therefore, for the function defined by $f(t) = 14t + 9$, 9 represents the value of $f(t)$ when the value of t is 0. This means that 0 months after the vine plant was purchased, the estimated length of the vine plant was 9 inches. Therefore, the best interpretation of 9 in this context is the estimated length of the vine plant was 9 inches when Tavon purchased it.

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

Choice B is incorrect. The vine plant is expected to grow 14 inches, not 9 inches, each month.

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

Question Difficulty: Easy

Question ID 2e29c990

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 2e29c990

The function f is defined by $f(x) = 4x$. For what value of x does $f(x) = 8$?

ID: 2e29c990 Answer

Correct Answer: 2

Rationale

The correct answer is 2. Substituting 8 for $f(x)$ in the given equation yields $8 = 4x$. Dividing the left- and right-hand sides of this equation by 4 yields $x = 2$. Therefore, the value of x is 2 when $f(x) = 8$.

Question Difficulty: Easy

Question ID 136de2ff

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 136de2ff

$$f(x) = 14 + 4x$$

The function f represents the total cost, in dollars, of attending an arcade when x games are played. How many games can be played for a total cost of $\$58$?

ID: 136de2ff Answer

Correct Answer: 11

Rationale

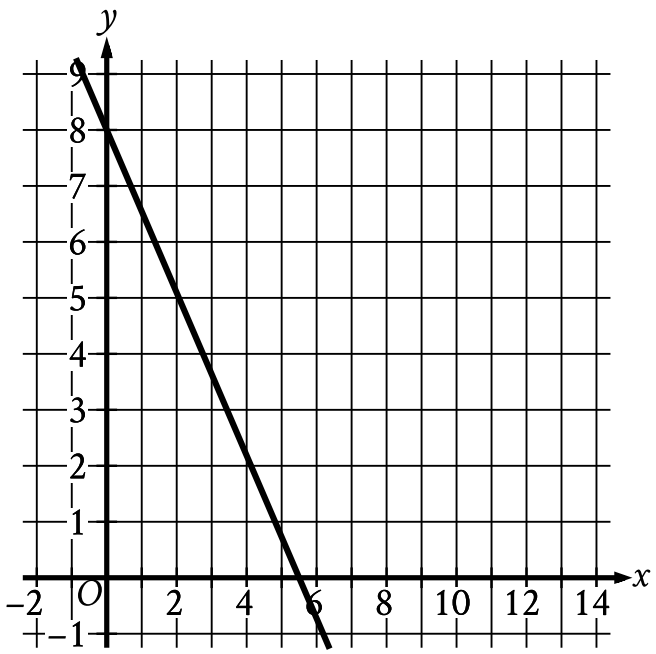
The correct answer is 11. It's given that the function $f(x) = 14 + 4x$ represents the total cost, in dollars, of attending an arcade when x games are played. Substituting 58 for $f(x)$ in the given equation yields $58 = 14 + 4x$. Subtracting 14 from each side of this equation yields $44 = 4x$. Dividing each side of this equation by 4 yields $11 = x$. Therefore, 11 games can be played for a total cost of $\$58$.

Question Difficulty: Easy

Question ID 58d1b8bf

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 58d1b8bf



The graph of the linear function f is shown, where $y = f(x)$. What is the *y*-intercept of the graph of f?

A. $(0, 0)$

B. $(0, -\frac{16}{11})$

C. $(0, -8)$

D. $(0, 8)$

ID: 58d1b8bf Answer

Correct Answer: D

Rationale

Choice D is correct. The *y*-intercept of a graph is the point where the graph intersects the *y*-axis. The graph of function f shown intersects the *y*-axis at the point $(0, 8)$. Therefore, the *y*-intercept of the graph of f is $(0, 8)$.

Choice A is incorrect. This is the point where the *x*-axis, not the graph of f, intersects the *y*-axis.

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: Easy

Question ID eefbcc02

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: eefbcc02

The function f is defined by $f(x) = \frac{7}{10}x + 55$. What is the value of $f(20)$?

ID: eefbcc02 Answer

Correct Answer: 69

Rationale

The correct answer is 69. The value of $f(20)$ can be found by evaluating the function $f(x) = \frac{7}{10}x + 55$ for $x = 20$. Substituting 20 for x in this function yields $f(20) = \frac{7}{10}(20) + 55$, or $f(20) = 69$. Therefore, the value of $f(20)$ is 69.

Question Difficulty: Easy

Question ID fadca26a

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: fadca26a

To repair a refrigerator, a technician charges $\$60$ per hour for labor plus $\$120$ for parts. Which function f represents the total amount, in dollars, the technician will charge for this job if it takes x hours?

A. $f(x) = x + 120$

B. $f(x) = 60x$

C. $f(x) = 60x + 120$

D. $f(x) = 60x - 120$

ID: fadca26a Answer

Correct Answer: C

Rationale

Choice C is correct. It's given that the technician charges $\$60$ per hour for labor. Therefore, if the job takes x hours, the technician will charge $\left(\frac{\$60}{1 \text{ hour}}\right)(x \text{ hours})$, or $\$60x$, for labor. It's also given that the technician charges $\$120$ for parts. Therefore, $f(x) = 60x + 120$ represents the total amount, in dollars, the technician will charge for this job if it takes x hours.

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

Choice B is incorrect. This function represents the total amount, in dollars, the technician charges for labor only, not the total amount charged for labor and parts.

Choice D is incorrect. This function represents the total amount, in dollars, the technician would charge if the charge for parts were subtracted from, rather than added to, the charge for labor.

Question Difficulty: Easy

Question ID 7f234c59

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 7f234c59

$$f(x) = 4x + b$$

For the linear function f, b is a constant and $f(7) = 28$. What is the value of b?

A. 0

B. 1

C. 4

D. 7

ID: 7f234c59 Answer

Correct Answer: A

Rationale

Choice A is correct. For the linear function f, it's given that $f(7) = 28$. Substituting 7 for x and 28 for $f(x)$ in the given function yields $28 = 4(7) + b$, or $28 = 28 + b$. Subtracting 28 from each side of this equation yields $0 = b$. Therefore, the value of b is 0.

Choice B is incorrect. Substituting 1 for b in the given function yields $f(x) = 4x + 1$. For this function, when the value of x is 7, the value of $f(x)$ is 29, not 28.

Choice C is incorrect. Substituting 4 for b in the given function yields $f(x) = 4x + 4$. For this function, when the value of x is 7, the value of $f(x)$ is 32, not 28.

Choice D is incorrect. Substituting 7 for b in the given function yields $f(x) = 4x + 7$. For this function, when the value of x is 7, the value of $f(x)$ is 35, not 28.

Question Difficulty: Easy

Question ID 8c2135ea

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 8c2135ea

The function f is defined by $f(x) = 4x - 3$. What is the value of $f(10)$?

A. -30

B. 37

C. 40

D. 43

ID: 8c2135ea Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that the function f is defined by $f(x) = 4x - 3$. Substituting 10 for x in the given function yields $f(10) = 4(10) - 3$, which is equivalent to $f(10) = 40 - 3$, or $f(10) = 37$. Therefore, the value of $f(10)$ is 37.

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

Choice C is incorrect. This is the value of $f(10)$ for the function $f(x) = 4x$, not $f(x) = 4x - 3$.

Choice D is incorrect. This is the value of $f(10)$ for the function $f(x) = 4x + 3$, not $f(x) = 4x - 3$.

Question Difficulty: Easy

Question ID 22a0072f

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 22a0072f

A bus is traveling at a constant speed along a straight portion of road. The equation $d = 30t$ gives the distance d, in feet from a road marker, that the bus will be t seconds after passing the marker. How many feet from the marker will the bus be 2 seconds after passing the marker?

A. 30

B. 32

C. 60

D. 90

ID: 22a0072f Answer

Correct Answer: C

Rationale

Choice C is correct. It's given that t represents the number of seconds after the bus passes the marker. Substituting 2 for t in the given equation $d = 30t$ yields $d = 30(2)$, or $d = 60$. Therefore, the bus will be 60 feet from the marker 2 seconds after passing it.

Choice A is incorrect. This is the distance, in feet, the bus will be from the marker 1 second, not 2 seconds, after passing it.

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

Choice D is incorrect. This is the distance, in feet, the bus will be from the marker 3 seconds, not 2 seconds, after passing it.

Question Difficulty: Easy

Question ID 0b7a4088

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 0b7a4088

$$s = 40 + 3t$$

The equation gives the speed s, in miles per hour, of a certain car t seconds after it began to accelerate. What is the speed, in miles per hour, of the car 5 seconds after it began to accelerate?

A. 40

B. 43

C. 45

D. 55

ID: 0b7a4088 Answer

Correct Answer: D

Rationale

Choice D is correct. In the given equation, s is the speed, in miles per hour, of a certain car t seconds after it began to accelerate. Therefore, the speed of the car, in miles per hour, 5 seconds after it began to accelerate can be found by substituting 5 for t in the given equation, which yields $s = 40 + 3(5)$, or $s = 55$. Thus, the speed of the car 5 seconds after it began to accelerate is 55 miles per hour.

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: Easy

Question ID 8cc98d14

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 8cc98d14

The function f is defined by $f(x) = \frac{1}{2}(x + 6)$. What is the value of $f(4)$?

A. 20

B. 12

C. 10

D. 5

ID: 8cc98d14 Answer

Correct Answer: D

Rationale

Choice D is correct. It's given that the function f is defined by $f(x) = \frac{1}{2}(x + 6)$. Substituting 4 for x in the given function yields $f(4) = \frac{1}{2}(4 + 6)$, or $f(4) = 5$. Therefore, the value of $f(4)$ is 5.

Choice A is incorrect. This is the value of $2(4 + 6)$, not $\frac{1}{2}(4 + 6)$.

Choice B is incorrect. This is the value of $2 + (4 + 6)$, not $\frac{1}{2}(4 + 6)$.

Choice C is incorrect. This is the value of $4 + 6$, not $\frac{1}{2}(4 + 6)$.

Question Difficulty: Easy

Question ID 111d9f2f

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 111d9f2f

The function g is defined by $g(x) = 6x$. For what value of x is $g(x) = 54$?

ID: 111d9f2f Answer

Correct Answer: 9

Rationale

The correct answer is 9. It's given that $g(x) = 6x$. Substituting 54 for $g(x)$ in the given function yields $54 = 6x$. Dividing both sides of this equation by 6 yields $x = 9$. Therefore, the value of x when $g(x) = 54$ is 9.

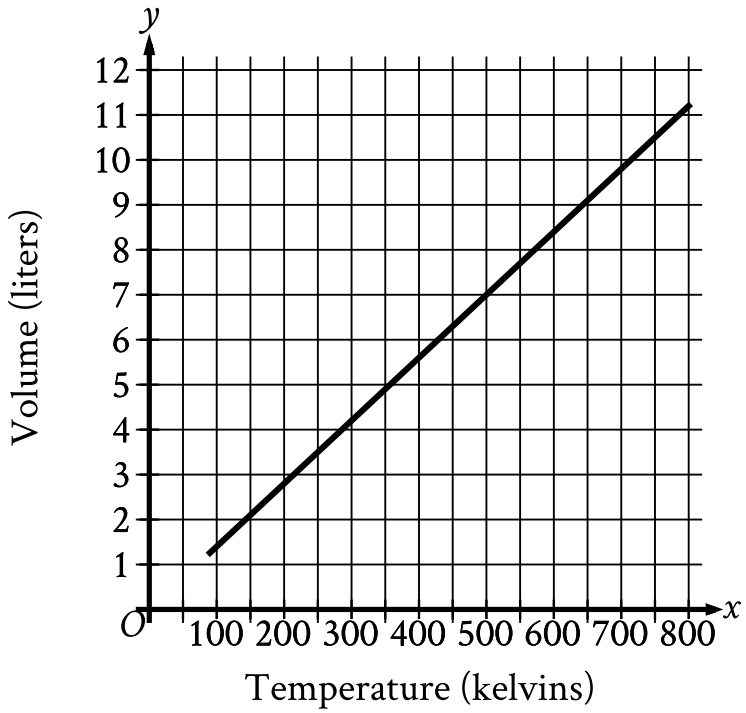
Question Difficulty: Easy

Question ID 16f3eb3d

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 16f3eb3d

Hydrogen is placed inside a container and kept at a constant pressure. The graph shows the estimated volume y, in liters, of the hydrogen when its temperature is x kelvins.



What is the estimated volume, in liters, of the hydrogen when its temperature is 500 kelvins?

A. 0

B. $\frac{7}{500}$

C. 7

D. $\frac{500}{7}$

ID: 16f3eb3d Answer

Correct Answer: C

Rationale

Choice C is correct. For the graph shown, the x-axis represents temperature, in kelvins, and the y-axis represents volume, in liters. Therefore, the estimated volume, in liters, of the hydrogen when its temperature is 500 kelvins is represented by the y-coordinate of the point on the graph that has an x-coordinate of 500. The point on the graph with an x-coordinate of 500 has a y-coordinate of 7. Therefore, the estimated volume, in liters, of the hydrogen when its temperature is 500 kelvins is 7.

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 9873a516

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 9873a516

For a training program, Juan rides his bike at an average rate of 5.7 minutes per mile. Which function m models the number of minutes it will take Juan to ride x miles at this rate?

A. $m(x) = \frac{x}{5.7}$

B. $m(x) = x + 5.7$

C. $m(x) = x - 5.7$

D. $m(x) = 5.7x$

ID: 9873a516 Answer

Correct Answer: D

Rationale

Choice D is correct. It's given that Juan rides his bike at an average rate of 5.7 minutes per mile. The number of minutes it will take Juan to ride x miles can be determined by multiplying his average rate by the number of miles, x, which yields $5.7x$. Therefore, the function $m(x) = 5.7x$ models the number of minutes it will take Juan to ride x miles.

Choice A is incorrect and may result from conceptual errors.

Choice B is incorrect and may result from conceptual errors.

Choice C is incorrect and may result from conceptual errors.

Question Difficulty: Easy

Question ID 85e48cf1

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 85e48cf1

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. $50{,}200$

ID: 85e48cf1 Answer

Correct Answer: B

Rationale

Choice B is correct. Substituting 50 for x in the given function yields $h(50) = 50 + 200$, or $h(50) = 250$. Therefore, the value of $h(50)$ is 250.

Choice A is incorrect. This is the value of $h(0)$.

Choice C is incorrect. This is the value of $h(9{,}800)$.

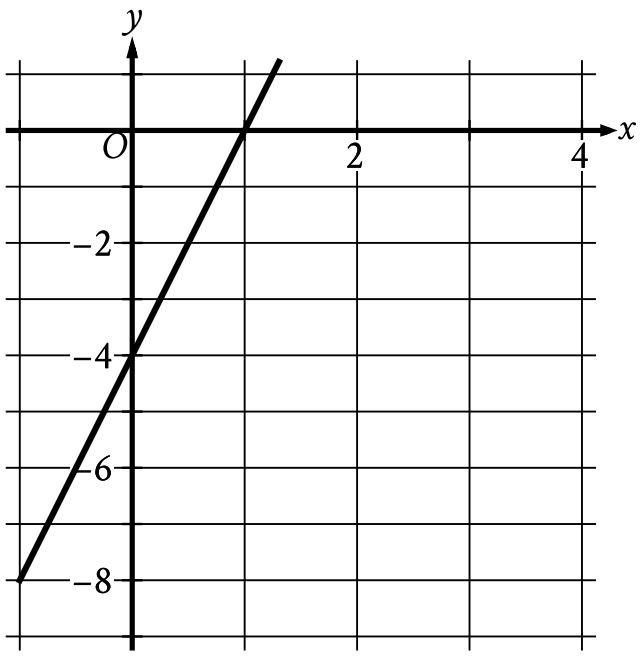
Choice D is incorrect. This is the value of $h(50{,}000)$.

Question Difficulty: Easy

Question ID 3cc268ac

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 3cc268ac



The graph of the function f is shown, where $y = f(x)$. What is the *y*-intercept of the graph?

A. $(0, -1)$

B. $(0, -4)$

C. $(0, 1)$

D. $(0, 4)$

ID: 3cc268ac Answer

Correct Answer: B

Rationale

Choice B is correct. The *y*-intercept of a graph is the point where the graph intersects the *y*-axis. The graph of function f shown intersects the *y*-axis at the point $(0, -4)$. Therefore, the *y*-intercept of the graph is $(0, -4)$.

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.

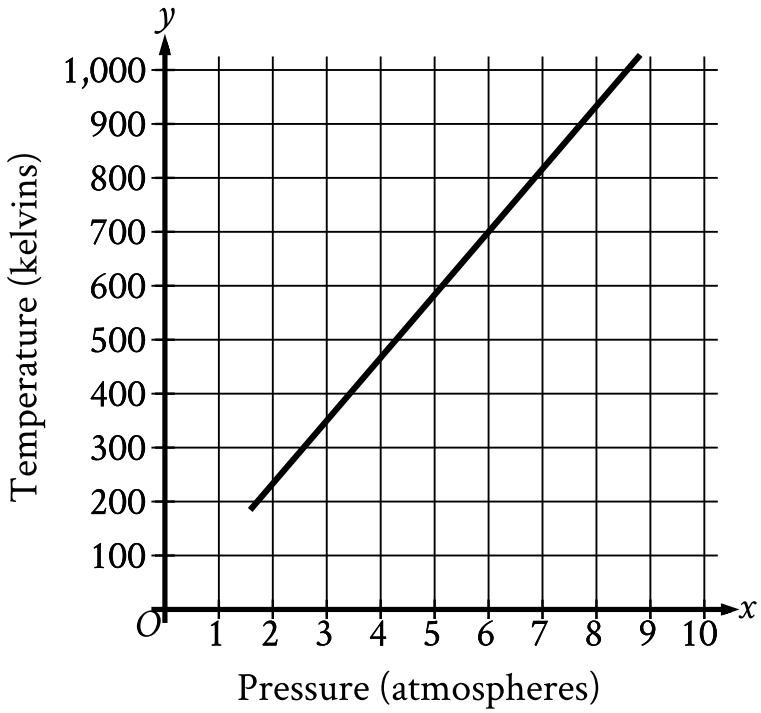
Question Difficulty: Easy

Question ID 86793098

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 86793098

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

ID: 86793098 Answer

Correct Answer: C

Rationale

Choice C is correct. For the graph shown, the x-axis represents pressure, in atmospheres, and the y-axis represents temperature, in kelvins. Therefore, the estimated temperature, in kelvins, of the oxygen gas when its pressure is 6 atmospheres is represented by the y-coordinate of the point on the graph that has an x-coordinate of 6. The point on the graph with an x-coordinate of 6 has a y-coordinate of approximately 700. Therefore, the estimated temperature, in kelvins, of the oxygen gas when its pressure is 6 atmospheres is 700.

Choice A is incorrect. This is the pressure, in atmospheres, not the estimated temperature, in kelvins, of the oxygen gas when its pressure is 6 atmospheres.

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: Easy

Question ID 0ddd17b2

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 0ddd17b2

In science class, Diego conducted an experiment to learn about evaporation. Diego measured the height of fluid in a beaker over a period of time. The function $f(x) = 39 - 0.18x$ gives the estimated height, $\textbf{in centimeters (cm)}$, of the fluid in the beaker x days after the start of the experiment. Which of the following is the best interpretation of 39 in this context?

A. The estimated height, $\textbf{in cm}$, of the fluid at the start of the experiment

B. The estimated height, $\textbf{in cm}$, of the fluid at the end of the experiment

C. The estimated change in the height, $\textbf{in cm}$, of the fluid each day

D. The estimated number of days for all the fluid to evaporate

ID: 0ddd17b2 Answer

Correct Answer: A

Rationale

Choice A is correct. It's given that the function $f(x) = 39 - 0.18x$ gives the estimated height, in centimeters (cm), of the fluid in the beaker x days after the start of the experiment. For a function defined by an equation of the form $f(x) = b + mx$, where m and b are constants, b represents the value of $f(x)$ when $x = 0$. It follows that in the given function, 39 represents the value of $f(x)$ when $x = 0$. Since $x = 0$ represents the start of the experiment, then the best interpretation of 39 in this context is that the estimated height, in cm, of the fluid was 39 at the start of the experiment.

Choice B is incorrect and may result from conceptual errors.

Choice C is incorrect. The estimated change in the height, in cm, of the fluid each day is 0.18, not 39.

Choice D is incorrect and may result from conceptual errors.

Question Difficulty: Easy

Question ID a7fd9fb4

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: a7fd9fb4

A student council group is selling school posters for a fundraiser. They use the function $p(x) = 5x - 220$ to determine their profit $p(x)$, in dollars, for selling x school posters. In order to earn a profit of $\$900$, how many school posters must they sell?

ID: a7fd9fb4 Answer

Correct Answer: 224

Rationale

The correct answer is 224. It's given that a student council group uses the function $p(x) = 5x - 220$ to determine their profit $p(x)$, in dollars, for selling x school posters. Substituting 900 for $p(x)$ in the given function yields $900 = 5x - 220$. Adding 220 to each side of this equation yields $1{,}120 = 5x$. Dividing each side of this equation by 5 yields $224 = x$. Therefore, in order to earn a profit of $\$900$, they must sell 224 school posters.

Question Difficulty: Easy

Question ID 2b384315

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 2b384315

$$g(x) = 11x + 4$$

For the given linear function g, which table shows three values of x and their corresponding values of $g(x)$?

A.

x	$g(x)$
-1	7
0	11
1	15

B.

x	$g(x)$
-1	-4
0	0
1	4

C.

x	$g(x)$
-1	-7
0	4
1	15

D.

x	$g(x)$
-1	-11
0	0
1	11

ID: 2b384315 Answer

Correct Answer: C

Rationale

Choice C is correct. Each of the tables shows the same three values of x: -1, 0, and 1. Substituting -1 for x in the given function yields $g(-1) = 11(-1) + 4$, or $g(-1) = -7$. Therefore, when $x = -1$, the corresponding value of $g(x)$ is -7. Substituting 0 for x in the given function yields $g(0) = 11(0) + 4$, or $g(0) = 4$. Therefore, when $x = 0$, the corresponding value of $g(x)$ is 4. Substituting 1 for x in the given function yields $g(1) = 11(1) + 4$, or $g(1) = 15$.

Therefore, when $x = 1$, the corresponding value of $g(x)$ is 15. The table in choice C shows -7, 4, and 15 as the corresponding value of $g(x)$ for *x*-values of -1, 0, and 1, respectively. Therefore, the table in choice C shows three values of x and their corresponding values of $g(x)$.

Choice A is incorrect. This table shows three values of x and their corresponding values of $g(x)$ for the linear function $g(x) = 4x + 11$.

Choice B is incorrect. This table shows three values of x and their corresponding values of $g(x)$ for the linear function $g(x) = 4x$.

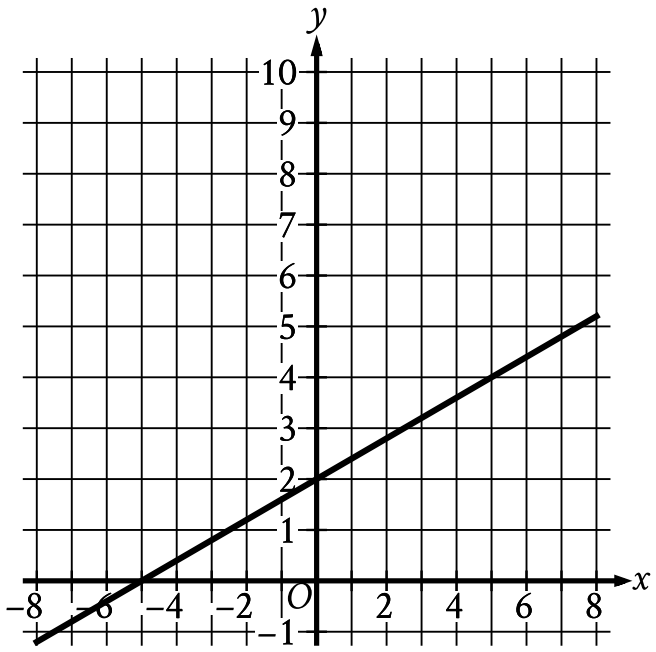
Choice D is incorrect. This table shows three values of x and their corresponding values of $g(x)$ for the linear function $g(x) = 11x$.

Question Difficulty: Easy

Question ID b850cfc2

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: b850cfc2



The graph of the linear function f is shown. What is the *y*-intercept of the graph of $y = f(x)$?

A. $(-5, 0)$

B. $(2, 0)$

C. $(0, 2)$

D. $(0, -5)$

ID: b850cfc2 Answer

Correct Answer: C

Rationale

Choice C is correct. The *y*-intercept of a graph is the point where the graph intersects the *y*-axis. The graph of $y = f(x)$ shown intersects the *y*-axis at the point $(0, 2)$. Therefore, the *y*-intercept of the graph of $y = f(x)$ is $(0, 2)$.

Choice A is incorrect. This is the *x*-intercept, not the *y*-intercept, of the graph of $y = f(x)$.

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: Easy

Question ID 59074d92

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 59074d92

The number y is 84 less than the number x. Which equation represents the relationship between x and y?

A. $y = x + 84$

B. $y = \frac{1}{84}x$

C. $y = 84x$

D. $y = x - 84$

ID: 59074d92 Answer

Correct Answer: D

Rationale

Choice D is correct. It's given that the number y is 84 less than the number x. A number that's 84 less than the number x is equivalent to 84 subtracted from the number x, or $x - 84$. Therefore, the equation $y = x - 84$ represents the relationship between x and y.

Choice A is incorrect and may result from conceptual errors.

Choice B is incorrect and may result from conceptual errors.

Choice C is incorrect and may result from conceptual errors.

Question Difficulty: Easy

Question ID 71228071

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: 71228071

The function g is defined by $g(x) = 4x - 6$. What is the value of $g(-7)$?

A. -34

B. -22

C. $-\frac{13}{4}$

D. $-\frac{1}{4}$

ID: 71228071 Answer

Correct Answer: A

Rationale

Choice A is correct. It's given that the function g is defined by $g(x) = 4x - 6$. Substituting -7 for x into the given equation yields $g(-7) = 4(-7) - 6$, or $g(-7) = -34$.

Choice B 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. This is the value of x for which $g(x) = -7$, not the value of $g(-7)$.

Question Difficulty: Easy

Question ID d977f302

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: d977f302

A veterinarian recommends that each day a certain rabbit should eat 25 calories per pound of the rabbit's weight, plus an additional 11 calories. Which equation represents this situation, where c is the total number of calories the veterinarian recommends the rabbit should eat each day if the rabbit's weight is x pounds?

A. $c = 25x$

B. $c = 36x$

C. $c = 11x + 25$

D. $c = 25x + 11$

ID: d977f302 Answer

Correct Answer: D

Rationale

Choice D is correct. It's given that a veterinarian recommends that each day the rabbit should eat 25 calories per pound of the rabbit's weight, plus an additional 11 calories. If the rabbit's weight is x pounds, then multiplying 25 calories per pound by the rabbit's weight, x pounds, yields $25x$ calories. Adding the additional 11 calories that the rabbit should eat each day yields $25x + 11$ calories. It's given that c is the total number of calories the veterinarian recommends the rabbit should eat each day if the rabbit's weight is x pounds. Therefore, this situation can be represented by the equation $c = 25x + 11$.

Choice A is incorrect. This equation represents a situation where a veterinarian recommends that each day the rabbit should eat 25 calories per pound of the rabbit's weight.

Choice B is incorrect. This equation represents a situation where a veterinarian recommends that each day the rabbit should eat $25 + 11$, or 36, calories per pound of the rabbit's weight.

Choice C is incorrect. This equation represents a situation where a veterinarian recommends that each day the rabbit should eat 11 calories per pound of the rabbit's weight, plus an additional 25 calories.

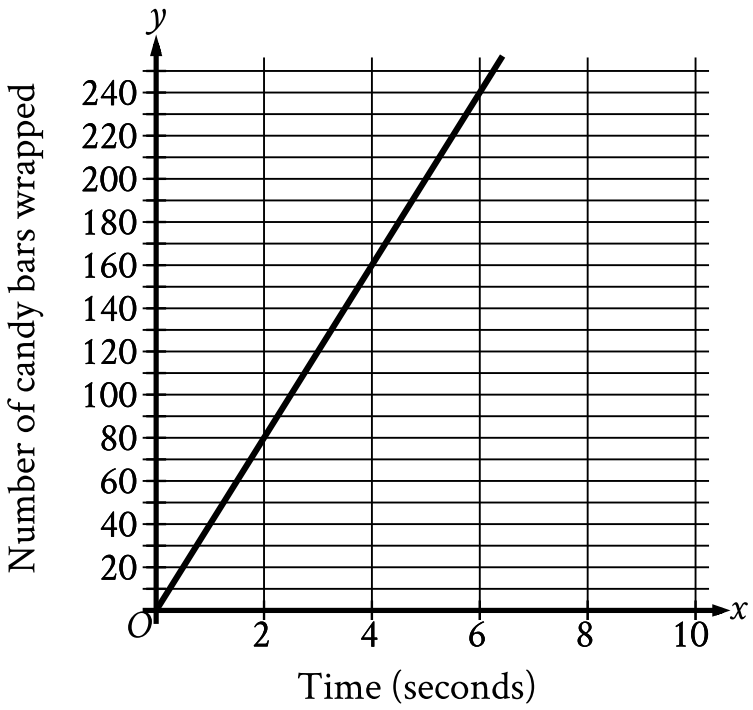
Question Difficulty: Easy

Question ID d627788b

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear functions	Easy

ID: d627788b

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

ID: d627788b Answer

Correct Answer: B

Rationale

Choice B is correct. For the graph shown, the *x*-axis represents time, in seconds, and the *y*-axis represents the number of candy bars wrapped. The slope of a line in the *xy*-plane is the change in y for each 1-unit increase in x. It follows that the slope of the graph shown represents the estimated number of candy bars the machine wraps with a label per second. The slope, m, of a line in the *xy*-plane can be found using any two points, (x_1, y_1) and (x_2, y_2), on the line and the slope formula $m = \frac{y_2 - y_1}{x_2 - x_1}$. The graph shown passes through the points $(0, 0)$ and $(2, 80)$. Substituting these points for (x_1, y_1) and (x_2, y_2), respectively, in the slope formula yields $m = \frac{80 - 0}{2 - 0}$, which is equivalent to $m = \frac{80}{2}$, or $m = 40$. Therefore, the estimated number of candy bars the machine wraps with a label per second is 40.

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