Question ID 2eb1f9e1

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: 2eb1f9e1

A line in the *xy*-plane has a slope of 9 and passes through the point $(0, -5)$. The equation $y = px + r$ defines the line, where p and r are constants. What is the value of p?

ID: 2eb1f9e1 Answer

Correct Answer: 9

Rationale

The correct answer is 9. It's given that the equation $y = px + r$ defines the line. In this equation, p represents the slope of the line and r represents the *y*-coordinate of the *y*-intercept of the line. It's given that the line has a slope of 9. Therefore, the value of p is 9.

Question Difficulty: Medium

Question ID 80f346ea

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: 80f346ea

A line passes through the points $(4, 6)$ and $(15, 24)$ in the *xy*-plane. What is the slope of the line?

ID: 80f346ea Answer

Correct Answer: 1.636, 18/11

Rationale

The correct answer is $\frac{18}{11}$. For a line that passes through the points (x_1, y_1) and (x_2, y_2) in the *xy*-plane, the slope of the line can be calculated using the slope formula, $m = \frac{y_2 - y_1}{x_2 - x_1}$. It's given that a line passes through the points $(4, 6)$ and $(15, 24)$ in the *xy*-plane. Substituting $(4, 6)$ for (x_1, y_1) and $(15, 24)$ for (x_2, y_2) in the slope formula, $m = \frac{y_2 - y_1}{x_2 - x_1}$, yields $m = \frac{24 - 6}{15 - 4}$, or $m = \frac{18}{11}$. Therefore, the slope of the line is $\frac{18}{11}$. Note that 18/11 and 1.636 are examples of ways to enter a correct answer.

Question Difficulty: Medium

Question ID 38f53fa4

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: 38f53fa4

Figure A and figure B are both regular polygons. The sum of the perimeter of figure A and the perimeter of figure B is 63 inches. The equation $3x + 6y = 63$ represents this situation, where x is the number of sides of figure A and y is the number of sides of figure B. Which statement is the best interpretation of 6 in this context?

A. Each side of figure B has a length of 6 inches.

B. The number of sides of figure B is 6.

C. Each side of figure A has a length of 6 inches.

D. The number of sides of figure A is 6.

ID: 38f53fa4 Answer

Correct Answer: A

Rationale

Choice A is correct. It's given that figure A and figure B (not shown) are both regular polygons and the sum of the perimeters of the two figures is 63 inches. It's also given that x is the number of sides of figure A and y is the number of sides of figure B, and that the equation $3x + 6y = 63$ represents this situation. Thus, $3x$ and $6y$ represent the perimeters, in inches, of figure A and figure B, respectively. Since $6y$ represents the perimeter, in inches, of figure B and y is the number of sides of figure B, it follows that each side of figure B has a length of 6 inches.

Choice B is incorrect. The number of sides of figure B is y, not 6.

Choice C is incorrect. Since the perimeter, in inches, of figure A is represented by $3x$, each side of figure A has a length of 3 inches, not 6 inches.

Choice D is incorrect. The number of sides of figure A is x, not 6.

Question Difficulty: Medium

Question ID 808e9650

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: 808e9650

A batch of banana milkshakes consists of 4 cups of ice cream and 2 bananas and has $1{,}114$ milligrams (mg) of calcium. There is 276 mg of calcium in 1 cup of the ice cream used to make this batch of milkshakes. How much calcium, in mg, is in 1 banana?

A. 5

B. 10

C. 419

D. $1{,}104$

ID: 808e9650 Answer

Correct Answer: A

Rationale

Choice A is correct. It's given that a batch of banana milkshakes consists of 4 cups of ice cream and 2 bananas and has $1{,}114$ mg of calcium. It's also given that there is 276 mg of calcium in 1 cup of the ice cream used to make this batch of milkshakes. It follows that the total amount of calcium in 4 cups of ice cream is $4(276)$, or $1{,}104$ mg. Let x represent the amount of calcium, in mg, in 1 banana. It follows that the total amount of calcium in 2 bananas is $2x$ mg. Since the batch of banana milkshakes has $1{,}114$ mg of calcium, the equation $1{,}104 + 2x = 1{,}114$ represents this situation. Subtracting $1{,}104$ from both sides of this equation yields $2x = 10$. Dividing both sides of this equation by 2 yields $x = 5$. Therefore, the amount of calcium in 1 banana is 5 mg.

Choice B is incorrect. This is the amount of calcium, in mg, in 2 bananas, not in 1 banana.

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

Choice D is incorrect. This is the amount of calcium, in mg, in 4 cups of ice cream, not in 1 banana.

Question Difficulty: Medium

Question ID a39e1c3b

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: a39e1c3b

What is the slope of the graph of $y = \frac{1}{4}(27x + 15) + 7x$ in the *xy*-plane?

ID: a39e1c3b Answer

Correct Answer: 13.75, 55/4

Rationale

The correct answer is $\frac{55}{4}$. In the *xy*-plane, the graph of an equation in the form $y = mx + b$, where m and b are constants, has a slope of m and a *y*-intercept of $(0, b)$. Applying the distributive property to the right-hand side of the given equation yields $y = \frac{27}{4}x + \frac{15}{4} + 7x$. Combining like terms yields $y = \frac{55}{4}x + \frac{15}{4}$. This equation is in the form $y = mx + b$, where $m = \frac{55}{4}$ and $b = \frac{15}{4}$. It follows that the slope of the graph of $y = \frac{1}{4}(27x + 15) + 7x$ in the *xy*-plane is $\frac{55}{4}$. Note that 55/4 and 13.75 are examples of ways to enter a correct answer.

Question Difficulty: Medium

Question ID dfbe86a3

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: dfbe86a3

Line r is defined by the equation $4x - 9y = 3$. Line s is parallel to line r in the *xy*-plane. What is the slope of line s?

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

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

C. -4

D. -9

ID: dfbe86a3 Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that line s is parallel to line r in the *xy*-plane. This means that the slope of line r is equal to the slope of line s. Line r is defined by the equation $4x - 9y = 3$. This equation can be written in slope-intercept form $y = mx + b$, where m represents the slope of the line and b represents the *y*-coordinate of the *y*-intercept of the line. Subtracting $4x$ from both sides of the equation $4x - 9y = 3$ yields $-9y = -4x + 3$. Dividing both sides of this equation by -9 yields $y = \frac{4}{9}x - \frac{1}{3}$. Therefore, the slope of line r is $\frac{4}{9}$. Since parallel lines have equal slopes, the slope of line s is also $\frac{4}{9}$.

Choice A is incorrect. This is the reciprocal of the slope of line s, not the slope of line s.

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

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

Question Difficulty: Medium

Question ID d609d1ce

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: d609d1ce

Line k is defined by $y = -\frac{17}{3}x + 5$. Line j is perpendicular to line k in the *xy*-plane. What is the slope of line j?

ID: d609d1ce Answer

Correct Answer: .1764, .1765, 3/17

Rationale

The correct answer is $\frac{3}{17}$. It's given that line j is perpendicular to line k in the *xy*-plane. This means that the slope of line j is the negative reciprocal of the slope of line k. The equation of line k, $y = -\frac{17}{3}x + 5$, is written in slope-intercept form $y = mx + b$, where m is the slope of the line and b is the *y*-coordinate of the *y*-intercept of the line. It follows that the slope of line k is $-\frac{17}{3}$. The negative reciprocal of a number is -1 divided by the number. Therefore, the negative reciprocal of $-\frac{17}{3}$ is $\frac{-1}{-\frac{17}{3}}$, or $\frac{3}{17}$. Thus, the slope of line j is $\frac{3}{17}$. Note that 3/17, .1764, .1765, and 0.176 are examples of ways to enter a correct answer.

Question Difficulty: Medium

Question ID ac7cddee

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: ac7cddee

When line n is graphed in the *xy*-plane, it has an *x*-intercept of $(-4, 0)$ and a *y*-intercept of $\left(0, \frac{86}{3}\right)$. What is the slope of line n?

A. $\frac{3}{344}$

B. $\frac{6}{43}$

C. $\frac{43}{6}$

D. $\frac{344}{3}$

ID: ac7cddee Answer

Correct Answer: C

Rationale

Choice C is correct. It's given that when line n is graphed in the *xy*-plane, it has an *x*-intercept of $(-4, 0)$ and a *y*-intercept of $\left(0, \frac{86}{3}\right)$. The slope, m, of a line can be found using any two points on the line, (x_1, y_1) and (x_2, y_2), and the slope formula $m = \frac{y_2 - y_1}{x_2 - x_1}$. Substituting the points $(-4, 0)$ and $\left(0, \frac{86}{3}\right)$ for (x_1, y_1) and (x_2, y_2), respectively, in the slope formula yields $m = \frac{\frac{86}{3} - 0}{0 - (-4)}$, or $m = \frac{43}{6}$. Therefore, the slope of line n is $\frac{43}{6}$.

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

Choice B is incorrect. This is the slope of a line that has an *x*-intercept of $\left(\frac{86}{3}, 0\right)$ and a *y*-intercept of $(0, -4)$.

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

Question Difficulty: Medium

Question ID e2b60318

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: e2b60318

Line p is defined by $2y + 18x = 9$. Line r is perpendicular to line p in the *xy*-plane. What is the slope of line r?

A. -9

B. $-\frac{1}{9}$

C. $\frac{1}{9}$

D. 9

ID: e2b60318 Answer

Correct Answer: C

Rationale

Choice C is correct. It's given that line r is perpendicular to line p in the *xy*-plane. This means that the slope of line r is the negative reciprocal of the slope of line p. If the equation for line p is rewritten in slope-intercept form $y = mx + b$, where m and b are constants, then m is the slope of the line and $(0, b)$ is its *y*-intercept. Subtracting $18x$ from both sides of the equation $2y + 18x = 9$ yields $2y = -18x + 9$. Dividing both sides of this equation by 2 yields $y = -9x + \frac{9}{2}$. It follows that the slope of line p is -9. The negative reciprocal of a number is -1 divided by the number. Therefore, the negative reciprocal of -9 is $\frac{-1}{-9}$, or $\frac{1}{9}$. Thus, the slope of line r is $\frac{1}{9}$.

Choice A is incorrect. This is the slope of line p, not line r.

Choice B is incorrect. This is the reciprocal, not the negative reciprocal, of the slope of line p.

Choice D is incorrect. This is the negative, not the negative reciprocal, of the slope of line p.

Question Difficulty: Medium

Question ID 28c92268

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: 28c92268

A total of 2 squares each have side length r. A total of 6 equilateral triangles each have side length t. None of these squares and triangles shares a side. The sum of the perimeters of all these squares and triangles is 210. Which equation represents this situation?

A. $6r + 24t = 210$

B. $2r + 6t = 210$

C. $8r + 18t = 210$

D. $6r + 2t = 210$

ID: 28c92268 Answer

Correct Answer: C

Rationale

Choice C is correct. It's given that a total of 2 squares each have side length r. Therefore, each of the squares has perimeter $4r$. Since there are a total of 2 squares, the sum of the perimeters of these squares is $4r + 4r$, which is equivalent to $2(4r)$, or $8r$. It's also given that a total of 6 equilateral triangles each have side length t. Therefore, each of the equilateral triangles has perimeter $3t$. Since there are a total of 6 equilateral triangles, the sum of the perimeters of these triangles is $3t + 3t + 3t + 3t + 3t + 3t$, which is equivalent to $6(3t)$, or $18t$. Since the sum of the perimeters of the squares is $8r$ and the sum of the perimeters of the triangles is $18t$, the sum of the perimeters of all these squares and triangles is $8r + 18t$. It's given that the sum of the perimeters of all these squares and triangles is 210. Therefore, the equation $8r + 18t = 210$ represents this situation.

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: Medium

Question ID d7941984

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: d7941984

Lily made 36 cups of jam. Lily then filled x small containers and y large containers with all the jam she made. The equation $4x + 6y = 36$ represents this situation. Which is the best interpretation of $6y$ in this context?

A. The number of large containers Lily filled

B. The number of small containers Lily filled

C. The total number of cups of jam in the large containers

D. The total number of cups of jam in the small containers

ID: d7941984 Answer

Correct Answer: C

Rationale

Choice C is correct. It's given that the equation $4x + 6y = 36$ represents the situation where Lily filled x small containers and y large containers with all the jam she made, which was 36 cups. Therefore, $6y$ represents the total number of cups of jam in the large containers.

Choice A is incorrect. The number of large containers Lily filled is represented by y, not $6y$.

Choice B is incorrect. The number of small containers Lily filled is represented by x, not $6y$.

Choice D is incorrect. The total number of cups of jam in the small containers is represented by $4x$, not $6y$.

Question Difficulty: Medium

Question ID a2bf1dd6

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: a2bf1dd6

Line k is defined by $y = 7x + \frac{1}{8}$. Line j is perpendicular to line k in the *xy*-plane. What is the slope of line j?

A. -8

B. $-\frac{1}{7}$

C. $\frac{1}{8}$

D. 7

ID: a2bf1dd6 Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that line k is defined by $y = 7x + \frac{1}{8}$. For an equation in slope-intercept form $y = mx + b$, m represents the slope of the line defined by this equation in the *xy*-plane and b represents the *y*-coordinate of the *y*-intercept of this line. Therefore, the slope of line k is 7. It's also given that line j is perpendicular to line k in the *xy*-plane. Therefore, the slope of line j is the opposite reciprocal of the slope of line k. The opposite reciprocal of 7 is $-\frac{1}{7}$. Therefore, the slope of line j is $-\frac{1}{7}$.

Choice A is incorrect. This is the opposite reciprocal of the *y*-coordinate of the *y*-intercept, not the slope, of line k.

Choice C is incorrect. This is the *y*-coordinate of the *y*-intercept of line k, not the slope of line j.

Choice D is incorrect. This is the slope of a line that is parallel, not perpendicular, to line k.

Question Difficulty: Medium

Question ID cd13910e

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: cd13910e

What is the slope of the graph of $y = \frac{5x}{13} - 23$ in the *xy*-plane?

ID: cd13910e Answer

Correct Answer: .3846, 5/13

Rationale

The correct answer is $\frac{5}{13}$. The graph of a line in the *xy*-plane can be represented by the equation $y = mx + b$, where m is the slope of the line and b is the *y*-coordinate of the *y*-intercept. The given equation can be written as $y = \left(\frac{5}{13}\right)x - 23$. Therefore, the slope of the graph of this equation in the *xy*-plane is $\frac{5}{13}$. Note that 5/13, .3846, 0.385, and 0.384 are examples of ways to enter a correct answer.

Question Difficulty: Medium

Question ID bea3ba96

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: bea3ba96

$$24.5x + 24.75y = 641$$

Isabel ordered topsoil and crushed stone, which cost a total of $\$641$, for her garden. The given equation represents the relationship between the number of cubic yards of topsoil, x, and the number of tons of crushed stone, y, Isabel ordered. How much more, in dollars, did a ton of crushed stone cost Isabel than a cubic yard of topsoil?

ID: bea3ba96 Answer

Correct Answer: 0.25, 1/4

Rationale

The correct answer is $.25$. It's given that the topsoil and crushed stone Isabel ordered for her garden cost a total of $\$641$. It's also given that the equation $24.5x + 24.75y = 641$ represents the relationship between the number of cubic yards of topsoil, x, and the number of tons of crushed stone, y, that Isabel ordered. Since x represents the number of cubic yards of topsoil ordered, $24.5x$ represents the total cost, in dollars, of the topsoil, and the cost per cubic yard of topsoil is $\$24.50$. Similarly, since y represents the number of tons of crushed stone ordered, $24.75y$ represents the total cost, in dollars, of crushed stone ordered, and the cost per ton of crushed stone is $\$24.75$. Therefore, a ton of crushed stone cost Isabel $24.75 - 24.50$, or 0.25, more dollars than a cubic yard of topsoil. Note that .25 and 1/4 are examples of ways to enter a correct answer.

Question Difficulty: Medium

Question ID 0edb622e

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: 0edb622e

If the graph of $27x + 33y = 297$ is shifted down 5 units in the *xy*-plane, what is the *y*-intercept of the resulting graph?

A. $(0, 4)$

B. $(0, 6)$

C. $(0, 14)$

D. $(0, 28)$

ID: 0edb622e Answer

Correct Answer: A

Rationale

Choice A is correct. When the graph of an equation in the form $Ax + By = C$, where A, B, and C are constants, is shifted down k units in the *xy*-plane, the resulting graph can be represented by the equation $Ax + B(y + k) = C$. It's given that the graph of $27x + 33y = 297$ is shifted down 5 units in the *xy*-plane. Therefore, the resulting graph can be represented by the equation $27x + 33(y + 5) = 297$, or $27x + 33y + 165 = 297$. Subtracting 165 from both sides of this equation yields $27x + 33y = 132$. The *y*-intercept of the graph of an equation in the *xy*-plane is the point where the line intersects the *y*-axis, represented by the point $(0, y)$. Substituting 0 for x in the equation $27x + 33y = 132$ yields $27(0) + 33y = 132$, or $33y = 132$. Dividing both sides of this equation by 33 yields $y = 4$. Therefore, if the graph of $27x + 33y = 297$ is shifted down 5 units, the *y*-intercept of the resulting graph is $(0, 4)$.

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

Choice C is incorrect. This is the *y*-intercept of the graph of $27x + 33y = 297$ shifted up, not down, 5 units.

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

Question Difficulty: Medium

Question ID 3c65fb48

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: 3c65fb48

x	y
-6	$n+184$
-3	$n+92$
0	n

The table shows three values of x and their corresponding values of y, where n is a constant, for the linear relationship between x and y. What is the slope of the line that represents this relationship in the *xy*-plane?

A. $-\frac{92}{3}$

B. $-\frac{3}{92}$

C. $\frac{n+92}{-3}$

D. $\frac{2n-92}{3}$

ID: 3c65fb48 Answer

Correct Answer: A

Rationale

Choice A is correct. The slope, m, of a line in the *xy*-plane can be found using two points on the line, (x_1, y_1) and (x_2, y_2), and the slope formula $m = \frac{y_2-y_1}{x_2-x_1}$. Based on the given table, the line representing the relationship between x and y in the *xy*-plane passes through the points $(-6, n+184)$, $(-3, n+92)$, and $(0, n)$, where n is a constant. Substituting two of these points, $(-3, n+92)$ and $(0, n)$, for (x_1, y_1) and (x_2, y_2), respectively, in the slope formula yields $m = \frac{n-(n+92)}{0-(-3)}$, which is equivalent to $m = \frac{n-n-92}{0+3}$, or $m = -\frac{92}{3}$. Therefore, the slope of the line that represents this relationship in the *xy*-plane is $-\frac{92}{3}$.

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: Medium

Question ID e0a370ba

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: e0a370ba

A neighborhood consists of a 2-hectare park and a 35-hectare residential area. The total number of trees in the neighborhood is $3{,}934$. The equation $2x + 35y = 3{,}934$ represents this situation. Which of the following is the best interpretation of *x* in this context?

A. The average number of trees per hectare in the park

B. The average number of trees per hectare in the residential area

C. The total number of trees in the park

D. The total number of trees in the residential area

ID: e0a370ba Answer

Correct Answer: A

Rationale

Choice A is correct. It's given that a neighborhood consists of a 2-hectare park and a 35-hectare residential area and that the total number of trees in the neighborhood is $3{,}934$. It's also given that the equation $2x + 35y = 3{,}934$ represents this situation. Since the total number of trees for a given area can be determined by taking the number of hectares times the average number of trees per hectare, this must mean that the terms $2x$ and $35y$ correspond to the number of trees in the park and in the residential area, respectively. Since $2x$ corresponds to the number of trees in the park, and 2 is the size of the park, in hectares, x must represent the average number of trees per hectare in the park.

Choice B is incorrect and may result from conceptual errors.

Choice C is incorrect and may result from conceptual errors.

Choice D is incorrect and may result from conceptual errors.

Question Difficulty: Medium

Question ID 0dac9e81

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: 0dac9e81

In the *xy*-plane, line k passes through the points $(0, -5)$ and $(1, -1)$. Which equation defines line k?

A. $y = -x + \frac{1}{4}$

B. $y = \frac{1}{4}x - 5$

C. $y = -x + 4$

D. $y = 4x - 5$

ID: 0dac9e81 Answer

Correct Answer: D

Rationale

Choice D is correct. An equation defining a line in the *xy*-plane can be written in the form $y = mx + b$, where m represents the slope and $(0, b)$ represents the *y*-intercept of the line. It's given that line k passes through the point $(0, -5)$; therefore, $b = -5$. The slope, m, of a line can be found using any two points on the line, (x_1, y_1) and (x_2, y_2), and the slope formula $m = \frac{y_2 - y_1}{x_2 - x_1}$. Substituting the points $(0, -5)$ and $(1, -1)$ for (x_1, y_1) and (x_2, y_2), respectively, in the slope formula yields $m = \frac{(-1-(-5))}{(1-0)}$, or $m = 4$. Substituting 4 for m and -5 for b in the equation $y = mx + b$ yields $y = 4x - 5$.

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

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

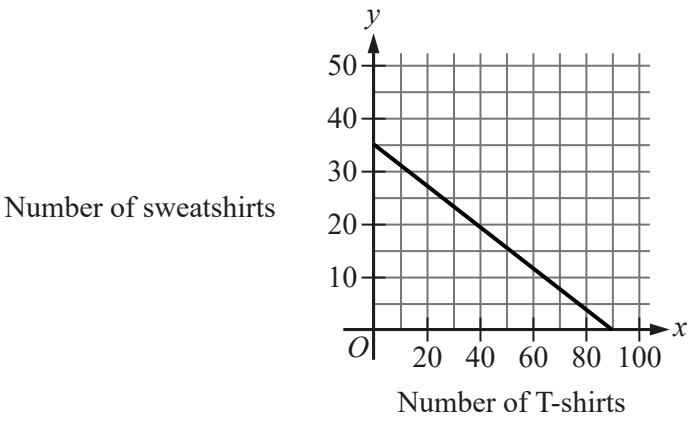
Choice C is incorrect and may result from conceptual or calculation errors.

Question Difficulty: Medium

Question ID 9153c6e2

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: 9153c6e2



The graph models the relationship between the number of T-shirts, x, and the number of sweatshirts, y, that Kira can purchase for a school fundraiser. Which equation could represent this relationship?

A. $y = 7x + 18$

B. $7x + 18y = 630$

C. $y = 18x + 7$

D. $18x + 7y = 630$

ID: 9153c6e2 Answer

Correct Answer: B

Rationale

Choice B is correct. A line in the *xy*-plane can be written as $y = mx + b$, where m is the slope of the line and b is the *y*-coordinate of the *y*-intercept. The graph shown is a line passing through the points $(0, 35)$ and $(90, 0)$. Substituting 0 for x and 35 for y in the equation $y = mx + b$ yields $35 = m(0) + b$, or $35 = b$. Substituting 35 for b, 90 for x, and 0 for y in the equation $y = mx + b$ yields $0 = 90m + 35$. Subtracting 35 from both sides of this equation yields $-35 = 90m$. Dividing both sides of this equation by 90 yields $-\frac{35}{90} = m$, or $-\frac{7}{18} = m$. Substituting $-\frac{7}{18}$ for m and 35 for b in the equation $y = mx + b$ yields $y = -\frac{7}{18}x + 35$. Multiplying both sides of this equation by 18 yields $18y = -7x + 35(18)$, or $18y = -7x + 630$. Adding $7x$ to both sides of this equation yields $7x + 18y = 630$. Therefore, the equation $7x + 18y = 630$ represents the relationship between x and y modeled by the graph.

Choice A is incorrect. The point $(0, 35)$ is not on the graph of this equation, since $7(0) + 18 = 18$, not 35.

Choice C is incorrect. The point $(0, 35)$ is not on the graph of this equation, since $18(0) + 7 = 7$, not 35.

Choice D is incorrect. The point $(90, 0)$ is not on the graph of this equation, since $18(90) + 7(0) = 1{,}620$, not 630.

Question Difficulty: Medium

Question ID 1c769c42

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: 1c769c42

At a state fair, attendees can win tokens that are worth a different number of points depending on the shape. One attendee won S square tokens and C circle tokens worth a total of $1{,}120$ points. The equation $80S + 90C = 1{,}120$ represents this situation. How many more points is a circle token worth than a square token?

A. 950

B. 90

C. 80

D. 10

ID: 1c769c42 Answer

Correct Answer: D

Rationale

Choice D is correct. It's given that the equation $80S + 90C = 1{,}120$ represents this situation, where S is the number of square tokens won, C is the number of circle tokens won, and $1{,}120$ is the total number of points the tokens are worth. It follows that $80S$ represents the total number of points the square tokens are worth. Therefore, each square token is worth 80 points. It also follows that $90C$ represents the total number of points the circle tokens are worth. Therefore, each circle token is worth 90 points. Since a circle token is worth 90 points and a square token is worth 80 points, then a circle token is worth $90 - 80$, or 10, more points than a square token.

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

Choice B is incorrect. This is the number of points a circle token is worth.

Choice C is incorrect. This is the number of points a square token is worth.

Question Difficulty: Medium

Question ID 58c789fd

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: 58c789fd

In the *xy*-plane, line s passes through the point $(0, 0)$ and is parallel to the line represented by the equation $y = 18x + 2$. If line s also passes through the point $(4, d)$, what is the value of d?

A. 2

B. 18

C. 72

D. 74

ID: 58c789fd Answer

Correct Answer: C

Rationale

Choice C is correct. A line in the *xy*-plane can be represented by an equation of the form $y = mx + b$, where m is the slope and b is the *y*-coordinate of the *y*-intercept of the line. It's given that line s passes through the point $(0, 0)$. Therefore, the *y*-coordinate of the *y*-intercept of line s is 0. It's also given that line s is parallel to the line represented by the equation $y = 18x + 2$. Since parallel lines have the same slope, it follows that the slope of line s is 18. Therefore, line s can be represented by the equation $y = mx + b$, where $m = 18$ and $b = 0$. Substituting 18 for m and 0 for b in $y = mx + b$ yields the equation $y = 18x + 0$, or $y = 18x$. If line s passes through the point $(4, d)$, then when $x = 4$, $y = d$ for the equation $y = 18x$. Substituting 4 for x and d for y in this equation yields $d = 18(4)$, or $d = 72$.

Choice A is incorrect. This is the *y*-coordinate of the *y*-intercept of the line represented by the equation $y = 18x + 2$.

Choice B is incorrect. This is the slope of the line represented by the equation $y = 18x + 2$.

Choice D is incorrect. The line represented by the equation $y = 18x + 2$, not line s, passes through the point $(4, 74)$.

Question Difficulty: Medium

Question ID e4e977a4

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: e4e977a4

x	y
-6	65
-3	56
3	38
6	29

The table shows four values of x and their corresponding values of y. There is a linear relationship between x and y. Which of the following equations represents this relationship?

A. $9x + 3y = 141$

B. $9x + 3y = 3$

C. $3x + 9y = 141$

D. $3x + 9y = 3$

ID: e4e977a4 Answer

Correct Answer: A

Rationale

Choice A is correct. An equation representing the linear relationship between x and y can be written in slope-intercept form $y = mx + b$, where m is the slope of the graph of the equation in the *xy*-plane and $(0, b)$ is the *y*-intercept. The slope, m, can be calculated using two ordered pairs, (x_1, y_1) and (x_2, y_2), and the formula $m = \frac{y_2 - y_1}{x_2 - x_1}$. Substituting the ordered pairs $(-6, 65)$ and $(6, 29)$ from the table for (x_1, y_1) and (x_2, y_2), respectively, in this formula yields $m = \frac{29 - 65}{6 - (-6)}$, which is equivalent to $m = \frac{-36}{12}$, or $m = -3$. Substituting -3 for m in the formula $y = mx + b$ yields $y = -3x + b$. Substituting the point $(-6, 65)$ into this equation yields $65 = -3(-6) + b$, or $65 = 18 + b$. Subtracting 18 from both sides of this equation yields $47 = b$. Substituting 47 for b in the equation $y = -3x + b$ yields $y = -3x + 47$. Adding $3x$ to both sides of this equation yields $3x + y = 47$. Multiplying both sides of this equation by 3 yields $9x + 3y = 141$.

Choice B is incorrect. Substituting the point $(-6, 65)$ from the table into this equation yields $9(-6) + 3(65) = 3$, or $141 = 3$, which is false.

Choice C is incorrect. Substituting the point $(-6, 65)$ from the table into this equation yields $3(-6) + 9(65) = 141$, or $567 = 141$, which is false.

Choice D is incorrect. Substituting the point $(-6, 65)$ from the table into this equation yields $3(-6) + 9(65) = 3$, or $567 = 3$, which is false.

Question Difficulty: Medium

Question ID 432f9706

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: 432f9706

A certain township consists of a 5-hectare industrial park and a 24-hectare neighborhood. The total number of trees in the township is $4{,}529$. The equation $5x + 24y = 4{,}529$ represents this situation. Which of the following is the best interpretation of x in this context?

A. The average number of trees per hectare in the industrial park

B. The average number of trees per hectare in the neighborhood

C. The total number of trees in the industrial park

D. The total number of trees in the neighborhood

ID: 432f9706 Answer

Correct Answer: A

Rationale

Choice A is correct. It's given that a certain township consists of a 5-hectare industrial park and a 24-hectare neighborhood and that the total number of trees in the township is $4{,}529$. It's also given that the equation $5x + 24y = 4{,}529$ represents this situation. Since the total number of trees for a given area can be determined by taking the size of the area, in hectares, times the average number of trees per hectare, the best interpretation of $5x$ is the number of trees in the industrial park and the best interpretation of $24y$ is the number of trees in the neighborhood. Since 5 is the size of the industrial park, in hectares, the best interpretation of x is the average number of trees per hectare in the industrial park.

Choice B is incorrect and may result from conceptual errors.

Choice C is incorrect and may result from conceptual errors.

Choice D is incorrect and may result from conceptual errors.

Question Difficulty: Medium

Question ID 542971a2

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: 542971a2

The equation $7g + 7b = 840$ represents the number of blue tiles, b, and the number of green tiles, g, an artist needs for an 840-square-inch tile project. The artist needs 71 blue tiles for the project. How many green tiles does he need?

ID: 542971a2 Answer

Correct Answer: 49

Rationale

The correct answer is 49. It's given that the equation $7g + 7b = 840$ represents the number of blue tiles, b, and the number of green tiles, g, an artist needs for an 840-square-inch tile project. It's also given that the artist needs 71 blue tiles for the project. Substituting 71 for b in the equation $7g + 7b = 840$ yields $7g + 7(71) = 840$, or $7g + 497 = 840$. Subtracting 497 from both sides of this equation yields $7g = 343$. Dividing both sides of this equation by 7 yields $g = 49$. Therefore, the artist needs 49 green tiles for the project.

Question Difficulty: Medium

Question ID cec3c002

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: cec3c002

A store sells two different-sized containers of blueberries. The store's sales of these blueberries totaled 896.86 dollars last month. The equation $4.51x + 6.07y = 896.86$ represents this situation, where x is the number of smaller containers sold and y is the number of larger containers sold. According to the equation, what is the price, in dollars, of each smaller container?

ID: cec3c002 Answer

Correct Answer: 4.51, 451/100

Rationale

The correct answer is 4.51. It's given that the equation $4.51x + 6.07y = 896.86$ represents this situation, where x is the number of smaller containers sold, y is the number of larger containers sold, and 896.86 is the store's total sales, in dollars, of blueberries last month. Therefore, $4.51x$ represents the store's sales, in dollars, of smaller containers, and $6.07y$ represents the store's sales, in dollars, of larger containers. Since x is the number of smaller containers sold, the price, in dollars, of each smaller container is 4.51.

Question Difficulty: Medium

Question ID 524a5350

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: 524a5350

In the *xy*-plane, line t passes through the points $(0, 9)$ and $(1, 17)$. Which equation defines line t?

A. $y = \frac{1}{8}x + 9$

B. $y = x + \frac{1}{8}$

C. $y = x + 8$

D. $y = 8x + 9$

ID: 524a5350 Answer

Correct Answer: D

Rationale

Choice D is correct. An equation defining a line in the *xy*-plane can be written in the form $y = mx + b$, where m represents the slope and $(0, b)$ represents the *y*-intercept of the line. It's given that line t passes through the point $(0, 9)$; therefore, $b = 9$. The slope, m, of a line can be found using any two points on the line, (x_1, y_1) and (x_2, y_2), and the slope formula $m = \frac{y_2 - y_1}{x_2 - x_1}$. Substituting $(0, 9)$ and $(1, 17)$ for (x_1, y_1) and (x_2, y_2), respectively, in the slope formula yields $m = \frac{17 - 9}{1 - 0}$, or $m = 8$. Substituting 8 for m and 9 for b in the equation $y = mx + b$ yields $y = 8x + 9$.

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

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

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

Question Difficulty: Medium

Question ID 012136ca

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: 012136ca

x	1	2	3
y	11	16	21

The table shows three values of x and their corresponding values of y. Which equation represents the linear relationship between x and y?

A. $y = 5x + 6$

B. $y = 5x + 11$

C. $y = 6x + 5$

D. $y = 6x + 11$

ID: 012136ca Answer

Correct Answer: A

Rationale

Choice A is correct. The linear relationship between x and y can be represented by the equation $y = mx + b$, where m is the slope of the line in the *xy*-plane that represents the relationship, and b is the *y*-coordinate of the *y*-intercept. The slope can be computed using any two points on the line. The slope of a line between any two points, (x_1, y_1) and (x_2, y_2), on the line can be calculated using the slope formula, $m = \frac{y_2 - y_1}{x_2 - x_1}$. In the given table, each value of x and its corresponding value of y can be represented by a point (x, y). In the given table, when the value of x is 1, the corresponding value of y is 11 and when the value of x is 2, the corresponding value of y is 16. Therefore, the points $(1, 11)$ and $(2, 16)$ are on the line. Substituting $(1, 11)$ and $(2, 16)$ for (x_1, y_1) and (x_2, y_2), respectively, in the slope formula yields $m = \frac{16 - 11}{2 - 1}$, or $m = 5$. Substituting 5 for m in the equation $y = mx + b$ yields $y = 5x + b$. Substituting the first value of x in the table, 1, and its corresponding value of y, 11, for x and y, respectively, in this equation yields $11 = 5(1) + b$, or $11 = b + 5$. Subtracting 5 from both sides of this equation yields $6 = b$. Substituting 6 for b in the equation $y = 5x + b$ yields $y = 5x + 6$. Therefore, the equation $y = 5x + 6$ represents the linear relationship between x and y.

Choice B is incorrect. For this relationship, when the value of x is 1, the corresponding value of y is 16, not 11.

Choice C is incorrect. For this relationship, when the value of x is 2, the corresponding value of y is 17, not 16.

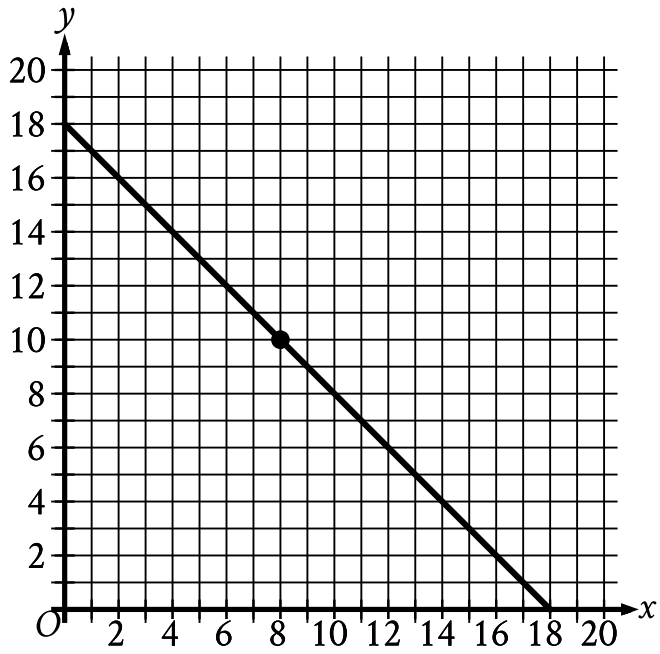
Choice D is incorrect. For this relationship, when the value of x is 1, the corresponding value of y is 17, not 11.

Question Difficulty: Medium

Question ID 50fef429

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: 50fef429



The graph in the *xy*-plane models the possible combinations of length x, in meters (m), and width y, in meters, for a rectangle with a perimeter of 36 m. Which statement is the best interpretation of the point $(8, 10)$ in this context?

A. The length is 10 m less than the perimeter, and the width is 8 m less than the perimeter.

B. The length is 10 m, and the width is 8 m.

C. The length is 8 m, and the width is 10 m.

D. The length is 8 m less than the perimeter, and the width is 10 m less than the perimeter.

ID: 50fef429 Answer

Correct Answer: C

Rationale

Choice C is correct. It's given that the graph in the *xy*-plane models the possible combinations of length x, in meters (m), and width y, in meters, for a rectangle with a perimeter of 36 m. Since x represents the length, in meters, and y represents the width, in meters, the point $(8, 10)$ in the *xy*-plane represents a rectangle whose length is 8 m and whose width is 10 m.

Choice A is incorrect and may result from conceptual errors.

Choice B is incorrect. This is an interpretation of the point $(10, 8)$, not $(8, 10)$.

Choice D is incorrect and may result from conceptual errors.

Question Difficulty: Medium

Question ID dd31a371

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: dd31a371

$$2.5b + 5r = 80$$

The given equation describes the relationship between the number of birds, b, and the number of reptiles, r, that can be cared for at a pet care business on a given day. If the business cares for 16 reptiles on a given day, how many birds can it care for on this day?

A. 0

B. 5

C. 40

D. 80

ID: dd31a371 Answer

Correct Answer: A

Rationale

Choice A is correct. The number of birds can be found by calculating the value of b when $r = 16$ in the given equation. Substituting 16 for r in the given equation yields $2.5b + 5(16) = 80$, or $2.5b + 80 = 80$. Subtracting 80 from both sides of this equation yields $2.5b = 0$. Dividing both sides of this equation by 2.5 yields $b = 0$. Therefore, if the business cares for 16 reptiles on a given day, it can care for 0 birds on this day.

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: Medium

Question ID ddfd6303

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: ddfd6303

$$2x + y = 37$$

In triangle QRS, sides QR and RS each have a length of x centimeters and side SQ has a length of y centimeters. The given equation represents this situation. Which of the following is the best interpretation of 37 in this context?

A. The difference, in centimeters, between the lengths of sides QR and SQ

B. The difference, in centimeters, between the lengths of sides QR and RS

C. The sum of the lengths, in centimeters, of the three sides of the triangle

D. The length, in centimeters, of one of the two sides of equal length

ID: ddfd6303 Answer

Correct Answer: C

Rationale

Choice C is correct. It's given that in triangle QRS, sides QR and RS each have a length of x centimeters. Therefore, the expression $2x$ represents the sum of the lengths, in centimeters, of sides QR and RS. It's also given that side SQ has a length of y centimeters. Therefore, the expression $2x + y$ represents the sum of the lengths, in centimeters, of sides QR, RS, and SQ. Since $2x + y$ is the sum of the lengths, in centimeters, of the three sides of the triangle and $2x + y = 37$, it follows that 37 is the sum of the lengths, in centimeters, of the three sides of the triangle.

Choice A is incorrect. The difference, in centimeters, between the lengths of sides QR and SQ is $x - y$, not 37.

Choice B is incorrect. The difference, in centimeters, between the lengths of sides QR and RS is $x - x$, or 0, not 37.

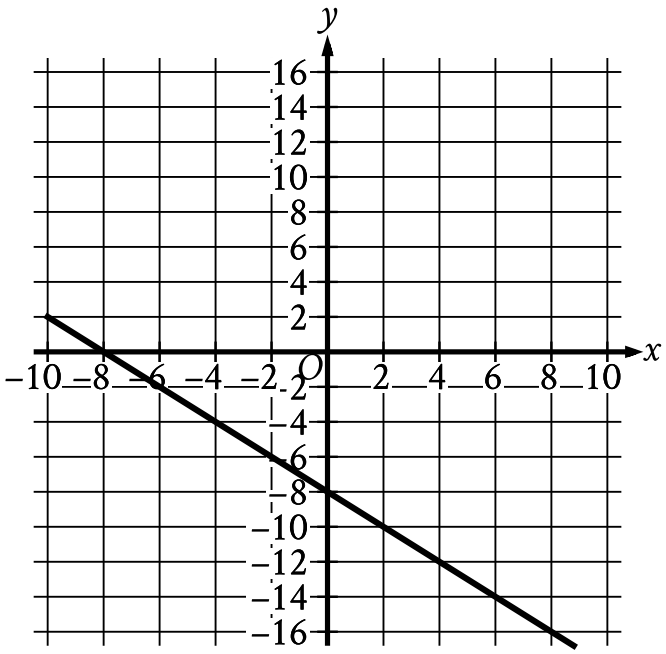
Choice D is incorrect. The length, in centimeters, of one of the two sides of equal length is x, not 37.

Question Difficulty: Medium

Question ID 96ddbb6a

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: 96ddbb6a



What is an equation of the graph shown?

A. $y = -2x - 8$

B. $y = x - 8$

C. $y = -x - 8$

D. $y = 2x - 8$

ID: 96ddbb6a Answer

Correct Answer: C

Rationale

Choice C is correct. An equation of a line can be written in the form $y = mx + b$, where m is the slope of the line and $(0, b)$ is the *y*-intercept of the line. The line shown passes through the point $(0, -8)$, so $b = -8$. The line shown also passes through the point $(-8, 0)$. The slope, m, of a line passing through two points (x_1, y_1) and (x_2, y_2) can be calculated using the equation $m = \frac{y_2 - y_1}{x_2 - x_1}$. For the points $(0, -8)$ and $(-8, 0)$, this gives $m = \frac{(-8) - 0}{0 - (-8)}$, or $m = -1$. Substituting -8 for b and -1 for m in $y = mx + b$ yields $y = (-1)x + (-8)$, or $y = -x - 8$. Therefore, an equation of the graph shown is $y = -x - 8$.

Choice A is incorrect. This is an equation of a line with a slope of -2, not -1.

Choice B is incorrect. This is an equation of a line with a slope of 1, not -1.

Choice D is incorrect. This is an equation of a line with a slope of 2, not -1.

Question Difficulty: Medium

Question ID 71dc13cb

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: 71dc13cb

Line t in the *xy*-plane has a slope of $-\frac{1}{3}$ and passes through the point $(9, 10)$. Which equation defines line t?

A. $y = 13x - \frac{1}{3}$

B. $y = 9x + 10$

C. $y = -\frac{x}{3} + 10$

D. $y = -\frac{x}{3} + 13$

ID: 71dc13cb Answer

Correct Answer: D

Rationale

Choice D is correct. The equation that defines line t in the *xy*-plane can be written in slope-intercept form $y = mx + b$, where m is the slope of line t and $(0, b)$ is its *y*-intercept. It's given that line t has a slope of $-\frac{1}{3}$. Therefore, $m = -\frac{1}{3}$. Substituting $-\frac{1}{3}$ for m in the equation $y = mx + b$ yields $y = -\frac{1}{3}x + b$, or $y = -\frac{x}{3} + b$. It's also given that line t passes through the point $(9, 10)$. Substituting 9 for x and 10 for y in the equation $y = -\frac{x}{3} + b$ yields $10 = -\frac{9}{3} + b$, or $10 = -3 + b$. Adding 3 to both sides of this equation yields $13 = b$. Substituting 13 for b in the equation $y = -\frac{x}{3} + b$ yields $y = -\frac{x}{3} + 13$.

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

Choice B is incorrect. This equation defines a line that has a slope of 9, not $-\frac{1}{3}$, and passes through the point $(0, 10)$, not $(9, 10)$.

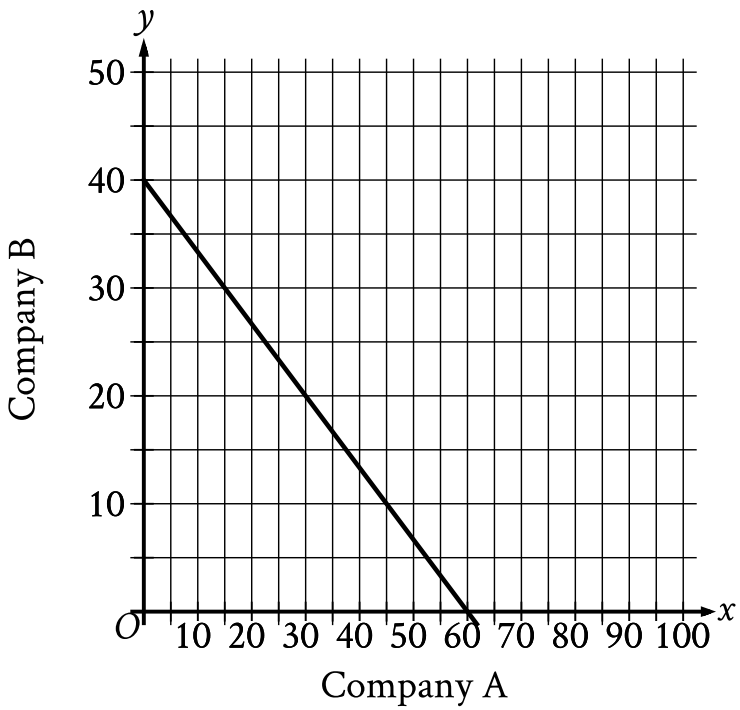
Choice C is incorrect. This equation defines a line that passes through the point $(0, 10)$, not $(9, 10)$.

Question Difficulty: Medium

Question ID 607bf204

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: 607bf204



The graph shows the relationship between the number of shares of stock from Company A, x, and the number of shares of stock from Company B, y, that Simone can purchase. Which equation could represent this relationship?

A. $y = 8x + 12$

B. $8x + 12y = 480$

C. $y = 12x + 8$

D. $12x + 8y = 480$

ID: 607bf204 Answer

Correct Answer: B

Rationale

Choice B is correct. The graph shown is a line passing through the points $(0, 40)$ and $(60, 0)$. Since the relationship between x and y is linear, if two points on the graph make a linear equation true, then the equation represents the relationship. Substituting 0 for x and 40 for y in the equation in choice B, $8x + 12y = 480$, yields $8(0) + 12(40) = 480$, or $480 = 480$, which is true. Substituting 60 for x and 0 for y in the equation $8x + 12y = 480$ yields $8(60) + 12(0) = 480$, or $480 = 480$, which is true. Therefore, the equation $8x + 12y = 480$ represents the relationship between x and y.

Choice A is incorrect. The point $(0, 40)$ is not on the graph of this equation, since $40 = 8(0) + 12$, or $40 = 12$, is not true.

Choice C is incorrect. The point $(0, 40)$ is not on the graph of this equation, since $40 = 12(0) + 8$, or $40 = 8$, is not true.

Choice D is incorrect. The point $(0, 40)$ is not on the graph of this equation, since $12(0) + 8(40) = 480$, or $320 = 480$, is not true.

Question Difficulty: Medium

Question ID c4aed842

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: c4aed842

A chemist combines water and acetic acid to make a mixture with a volume of 56 milliliters (mL). The volume of acetic acid in the mixture is 10 mL. What is the volume of water, in mL, in the mixture? (Assume that the volume of the mixture is the sum of the volumes of water and acetic acid before they were mixed.)

ID: c4aed842 Answer

Correct Answer: 46

Rationale

The correct answer is 46. It's given that a chemist combines water and acetic acid to make a mixture with a volume of 56 milliliters (mL) and that the volume of acetic acid in the mixture is 10 mL. Let x represent the volume of water, in mL, in the mixture. The equation $x + 10 = 56$ represents this situation. Subtracting 10 from both sides of this equation yields $x = 46$. Therefore, the volume of water, in mL, in the mixture is 46.

Question Difficulty: Medium

Question ID b272276f

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: b272276f

What is the slope of the graph of $y = \frac{1}{3}(29x + 10) + 5x$ in the *xy*-plane?

ID: b272276f Answer

Correct Answer: 14.66, 14.67, 44/3

Rationale

The correct answer is $\frac{44}{3}$. A linear equation can be written in the form $y = mx + b$, where m is the slope of the graph of the equation in the *xy*-plane and $(0, b)$ is the *y*-intercept. Distributing the $\frac{1}{3}$ in the equation $y = \frac{1}{3}(29x + 10) + 5x$ yields $y = \frac{29}{3}x + \frac{10}{3} + 5x$. Combining like terms on the right-hand side of this equation yields $y = \frac{44}{3}x + \frac{10}{3}$. This equation is in the form $y = mx + b$, where $m = \frac{44}{3}$ and $b = \frac{10}{3}$. Therefore, the slope of the graph of the given equation in the *xy*-plane is $\frac{44}{3}$. Note that 44/3, 14.66, and 14.67 are examples of ways to enter a correct answer.

Question Difficulty: Medium

Question ID 9df126c4

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: 9df126c4

What is the slope of the graph of $10x - 5y = -12$ in the *xy*-plane?

A. -2

B. $-\frac{5}{6}$

C. $\frac{5}{6}$

D. 2

ID: 9df126c4 Answer

Correct Answer: D

Rationale

Choice D is correct. A linear equation can be written in the form $y = mx + b$, where m is the slope of the graph of the equation in the *xy*-plane and $(0, b)$ is the *y*-intercept. Subtracting $10x$ from each side of the given equation, $10x - 5y = -12$, yields $-5y = -10x - 12$. Dividing each side of this equation by -5 yields $y = 2x + \frac{12}{5}$. This equation is in the form $y = mx + b$, where $m = 2$. Therefore, the slope of the graph of the given equation in the *xy*-plane is 2.

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

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

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

Question Difficulty: Medium

Question ID 0969c4e8

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear equations in two variables	Medium

ID: 0969c4e8

Line k is defined by $y = \frac{17}{7}x + 4$. Line j is parallel to line k in the *xy*-plane. What is the slope of line j?

A. $\frac{7}{17}$

B. $\frac{17}{7}$

C. 4

D. 17

ID: 0969c4e8 Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that line k is defined by $y = \frac{17x}{7} + 4$. For an equation of a line written in the form $y = mx + b$, m is the slope of the line and b is the *y*-coordinate of the *y*-intercept of the line. It follows that the slope of line k is $\frac{17}{7}$. It's also given that line j is parallel to line k in the *xy*-plane. Since parallel lines have equal slopes, line j also has a slope of $\frac{17}{7}$.

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

Choice C is incorrect. This is the *y*-coordinate of the *y*-intercept of line k, not the slope of line j.

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

Question Difficulty: Medium