

Question ID 89dc2564

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

ID: 89dc2564

Line k is defined by $y = 3x + 15$. Line j is perpendicular to line k in the xy -plane. What is the slope of line j ?

- A. $-\frac{1}{3}$
- B. $-\frac{1}{12}$
- C. $-\frac{1}{18}$
- D. $-\frac{1}{45}$

ID: 89dc2564 Answer

Correct Answer: A

Rationale

Choice A is correct. It's given that line j is perpendicular to line k in the xy -plane. It follows that the slope of line j is the opposite reciprocal of the slope of line k . The equation for line k 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 3 . The opposite reciprocal of a number is -1 divided by the number. Thus, the opposite reciprocal of 3 is $-\frac{1}{3}$. Therefore, the slope of line j is $-\frac{1}{3}$.

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: Easy

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 252d6b8a

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

ID: 252d6b8a

$$\begin{aligned}5x + 7y &= 1 \\ ax + by &= 1\end{aligned}$$

In the given pair of equations, a and b are constants. The graph of this pair of equations in the xy -plane is a pair of perpendicular lines. Which of the following pairs of equations also represents a pair of perpendicular lines?

- A. $10x + 7y = 1$
 $ax - 2by = 1$
- B. $10x + 7y = 1$
 $ax + 2by = 1$
- C. $10x + 7y = 1$
 $2ax + by = 1$
- D. $5x - 7y = 1$
 $ax + by = 1$

ID: 252d6b8a Answer

Correct Answer: B

Rationale

Choice B is correct. Two lines are perpendicular if their slopes are negative reciprocals, meaning that the slope of the first line is equal to -1 divided by the slope of the second line. Each equation in the given pair of equations 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. For the first equation, $5x + 7y = 1$, subtracting $5x$ from both sides gives $7y = -5x + 1$, and dividing both sides of this equation by 7 gives $y = -\frac{5}{7}x + \frac{1}{7}$. Therefore, the slope of the graph of this equation is $-\frac{5}{7}$. For the second equation, $ax + by = 1$, subtracting ax from both sides gives $by = -ax + 1$, and dividing both sides of this equation by b gives $y = -\frac{a}{b}x + \frac{1}{b}$. Therefore, the slope of the graph of this equation is $-\frac{a}{b}$. Since the graph of the given pair of equations is a pair of perpendicular lines, the slope of the graph of the second equation, $-\frac{a}{b}$, must be the negative reciprocal of the slope of the graph of the first equation, $-\frac{5}{7}$. The negative reciprocal of $-\frac{5}{7}$ is $\frac{-1}{(-\frac{5}{7})}$, or $\frac{7}{5}$. Therefore, $-\frac{a}{b} = \frac{7}{5}$, or $\frac{a}{b} = -\frac{7}{5}$. Similarly, rewriting the equations in choice B in slope-intercept form yields $y = -\frac{10}{7}x + \frac{1}{7}$ and $y = -\frac{a}{2b}x + \frac{1}{2b}$. It follows that the slope of the graph of the first equation in choice B is $-\frac{10}{7}$ and the slope of the graph of the second equation in choice B is $-\frac{a}{2b}$. Since $\frac{a}{b} = -\frac{7}{5}$, $-\frac{a}{2b}$ is equal to $-\left(\frac{1}{2}\right)\left(-\frac{7}{5}\right)$, or $\frac{7}{10}$. Since $\frac{7}{10}$ is the negative reciprocal of $-\frac{10}{7}$, the pair of equations in choice B represents a pair of perpendicular lines.

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: Hard

Question ID 950af39d

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

ID: 950af39d

A mixture consisting of only vitamin D and calcium has a total mass of **150** grams. The mass of vitamin D in the mixture is **50** grams. What is the mass, in grams, of calcium in the mixture?

- A. **200**
- B. **150**
- C. **100**
- D. **50**

ID: 950af39d Answer

Correct Answer: C

Rationale

Choice C is correct. Let *d* represent the mass, in grams, of vitamin D in the mixture, and let *c* represent the mass, in grams, of calcium in the mixture. It's given that the mixture consists of only vitamin D and calcium and that the total mass of the mixture is **150** grams. Therefore, the equation $d + c = 150$ represents this situation. It's also given that the mass of vitamin D in the mixture is **50** grams. Substituting **50** for *d* in the equation $d + c = 150$ yields $50 + c = 150$. Subtracting **50** from both sides of this equation yields $c = 100$. Therefore, the mass of calcium in the mixture is **100** grams.

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

Choice B is incorrect. This is the total mass, in grams, of the mixture, not the mass, in grams, of calcium in the mixture.

Choice D is incorrect. This is the mass, in grams, of vitamin D in the mixture, not the mass, in grams, of calcium in the mixture.

Question Difficulty: Easy

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 c73c84cc

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

ID: c73c84cc

The graph of $9x - 10y = 19$ is translated down 4 units in the xy -plane. What is the x -coordinate of the x -intercept of the resulting graph?

ID: c73c84cc Answer

Correct Answer: 59/9, 6.555, 6.556

Rationale

The correct answer is $\frac{59}{9}$. When the graph of an equation in the form $Ax + By = C$, where A , B , and C are constants, is translated 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 $9x - 10y = 19$ is translated down 4 units in the xy -plane. Therefore, the resulting graph can be represented by the equation $9x - 10(y + 4) = 19$, or $9x - 10y - 40 = 19$. Adding 40 to both sides of this equation yields $9x - 10y = 59$. The x -coordinate of the x -intercept of the graph of an equation in the xy -plane is the value of x in the equation when $y = 0$. Substituting 0 for y in the equation $9x - 10y = 59$ yields $9x - 10(0) = 59$, or $9x = 59$. Dividing both sides of this equation by 9 yields $x = \frac{59}{9}$. Therefore, the x -coordinate of the x -intercept of the resulting graph is $\frac{59}{9}$. Note that 59/9, 6.555, and 6.556 are examples of ways to enter a correct answer.

Question Difficulty: Hard

Question ID 95d2d776

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

ID: 95d2d776

A producer is creating a video with a length of **70** minutes. The video will consist of segments that are **1** minute long and segments that are **3** minutes long. Which equation represents this situation, where x represents the number of **1**-minute segments and y represents the number of **3**-minute segments?

- A. $4xy = 70$
- B. $4(x + y) = 70$
- C. $3x + y = 70$
- D. $x + 3y = 70$

ID: 95d2d776 Answer

Correct Answer: D

Rationale

Choice D is correct. Since x represents the number of **1**-minute segments and y represents the number of **3**-minute segments, the total length of the video is $1 \cdot x + 3 \cdot y$, or $x + 3y$, minutes. Since the video is **70** minutes long, the equation $x + 3y = 70$ represents this situation.

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 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 1cc52a1f

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

ID: 1cc52a1f

A certain apprentice has enrolled in **85** hours of training courses. The equation $10x + 15y = 85$ represents this situation, where x is the number of on-site training courses and y is the number of online training courses this apprentice has enrolled in. How many more hours does each online training course take than each on-site training course?

ID: 1cc52a1f Answer

Correct Answer: 5

Rationale

The correct answer is **5**. It's given that the equation $10x + 15y = 85$ represents the situation, where x is the number of on-site training courses, y is the number of online training courses, and **85** is the total number of hours of training courses the apprentice has enrolled in. Therefore, $10x$ represents the number of hours the apprentice has enrolled in on-site training courses, and $15y$ represents the number of hours the apprentice has enrolled in online training courses. Since x is the number of on-site training courses and y is the number of online training courses the apprentice has enrolled in, **10** is the number of hours each on-site course takes and **15** is the number of hours each online course takes. Subtracting these numbers gives $15 - 10$, or **5** more hours each online training course takes than each on-site training course.

Question Difficulty: Hard

Question ID e1dceebe

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

ID: e1dceebe

A teacher is creating an assignment worth **70** points. The assignment will consist of questions worth **1** point and questions worth **3** points. Which equation represents this situation, where x represents the number of **1**-point questions and y represents the number of **3**-point questions?

- A. $4xy = 70$
- B. $4(x + y) = 70$
- C. $3x + y = 70$
- D. $x + 3y = 70$

ID: e1dceebe Answer

Correct Answer: D

Rationale

Choice D is correct. Since x represents the number of **1**-point questions and y represents the number of **3**-point questions, the assignment is worth a total of $1 \cdot x + 3 \cdot y$, or $x + 3y$, points. Since the assignment is worth **70** points, the equation $x + 3y = 70$ represents this situation.

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 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 95cc0b50

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

ID: 95cc0b50

The graph of $7x + 2y = -31$ in the xy -plane has an x -intercept at $(a, 0)$ and a y -intercept at $(0, b)$, where a and b are constants. What is the value of $\frac{b}{a}$?

- A. $-\frac{7}{2}$
- B. $-\frac{2}{7}$
- C. $\frac{2}{7}$
- D. $\frac{7}{2}$

ID: 95cc0b50 Answer

Correct Answer: D

Rationale

Choice D is correct. The x -coordinate a of the x -intercept $(a, 0)$ can be found by substituting 0 for y in the given equation, which gives $7x + 2(0) = -31$, or $7x = -31$. Dividing both sides of this equation by 7 yields $x = -\frac{31}{7}$. Therefore, the value of a is $-\frac{31}{7}$. The y -coordinate b of the y -intercept $(0, b)$ can be found by substituting 0 for x in the given equation, which gives $7(0) + 2y = -31$, or $2y = -31$. Dividing both sides of this equation by 2 yields $y = -\frac{31}{2}$. Therefore, the value of b is $-\frac{31}{2}$. It follows that the value of $\frac{b}{a}$ is $\frac{-\frac{31}{2}}{-\frac{31}{7}}$, which is equivalent to $(\frac{31}{2})(\frac{7}{31})$, or $\frac{7}{2}$.

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

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

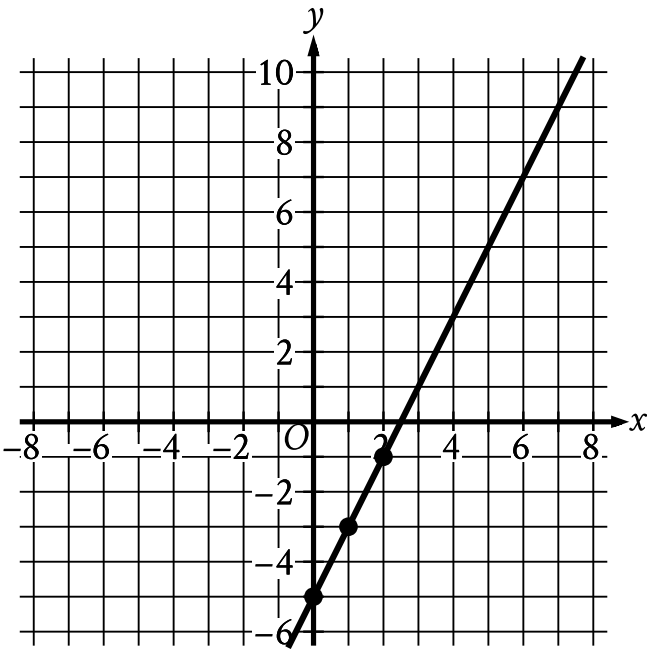
Choice C is incorrect and may result from conceptual or calculation errors.

Question Difficulty: Hard

Question ID ccb84027

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

ID: ccb84027



The graph shows the linear relationship between x and y . Which table gives three values of x and their corresponding values of y for this relationship?

- A.

x	y
0	0
1	-7
2	-9
- B.

x	y
0	0
1	-3
2	-1
- C.

x	y
0	-5
1	-7

2	−9
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D.

x	y
0	−5
1	−3
2	−1

ID: ccb84027 Answer

Correct Answer: D

Rationale

Choice D is correct. It's given that the graph shows the linear relationship between x and y . The given graph passes through the points $(0, -5)$, $(1, -3)$, and $(2, -1)$. It follows that when $x = 0$, the corresponding value of y is -5 , when $x = 1$, the corresponding value of y is -3 , and when $x = 2$, the corresponding value of y is -1 . Of the given choices, only the table in choice D gives these three values of x and their corresponding values of y for the relationship shown in the graph.

Choice A is incorrect. This table represents a relationship between x and y such that the graph passes through the points $(0, 0)$, $(1, -7)$, and $(2, -9)$.

Choice B is incorrect. This table represents a relationship between x and y such that the graph passes through the points $(0, 0)$, $(1, -3)$, and $(2, -1)$.

Choice C is incorrect. This table represents a linear relationship between x and y such that the graph passes through the points $(0, -5)$, $(1, -7)$, and $(2, -9)$.

Question Difficulty: Easy

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 8d7fb037

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

ID: 8d7fb037

x	y
18	130
23	160
26	178

For line h , the table shows three values of x and their corresponding values of y . Line k is the result of translating line h down 5 units in the xy -plane. What is the x-intercept of line k ?

- A. $(-\frac{26}{3}, 0)$
- B. $(-\frac{9}{2}, 0)$
- C. $(-\frac{11}{3}, 0)$
- D. $(-\frac{17}{6}, 0)$

ID: 8d7fb037 Answer

Correct Answer: D

Rationale

Choice D is correct. The equation of line h can be written in slope-intercept form $y = mx + b$, where m is the slope of the line and $(0, b)$ is the y -intercept of the line. It's given that line h contains the points $(18, 130)$, $(23, 160)$, and $(26, 178)$. Therefore, its slope m can be found as $\frac{160-130}{23-18}$, or 6. Substituting 6 for m in the equation $y = mx + b$ yields $y = 6x + b$. Substituting 130 for y and 18 for x in this equation yields $130 = 6(18) + b$, or $130 = 108 + b$. Subtracting 108 from both sides of this equation yields $22 = b$. Substituting 22 for b in $y = 6x + b$ yields $y = 6x + 22$. Since line k is the result of translating line h down 5 units, an equation of line k is $y = 6x + 22 - 5$, or $y = 6x + 17$. Substituting 0 for y in this equation yields $0 = 6x + 17$. Solving this equation for x yields $x = -\frac{17}{6}$. Therefore, the x-intercept of line k is $(-\frac{17}{6}, 0)$.

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: Hard

Question ID e7fef945

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

ID: e7fef945

What is the equation of the line that passes through the point $(0, 5)$ and is parallel to the graph of $y = 7x + 4$ in the xy -plane?

- A. $y = 5x$
- B. $y = 7x + 5$
- C. $y = 7x$
- D. $y = 5x + 7$

ID: e7fef945 Answer

Correct Answer: B

Rationale

Choice B is correct. The equation of a line in the xy -plane can be written in slope-intercept form $y = mx + b$, where m is the slope of the line and $(0, b)$ is its y -intercept. It's given that the line passes through the point $(0, 5)$. Therefore, $b = 5$. It's also given that the line is parallel to the graph of $y = 7x + 4$, which means the line has the same slope as the graph of $y = 7x + 4$. The slope of the graph of $y = 7x + 4$ is 7. Therefore, $m = 7$. Substituting 7 for m and 5 for b in the equation $y = mx + b$ yields $y = 7x + 5$.

Choice A is incorrect. The graph of this equation passes through the point $(0, 0)$, not $(0, 5)$, and has a slope of 5, not 7.

Choice C is incorrect. The graph of this equation passes through the point $(0, 0)$, not $(0, 5)$.

Choice D is incorrect. The graph of this equation passes through the point $(0, 7)$, not $(0, 5)$, and has a slope of 5, not 7.

Question Difficulty: Easy

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 .

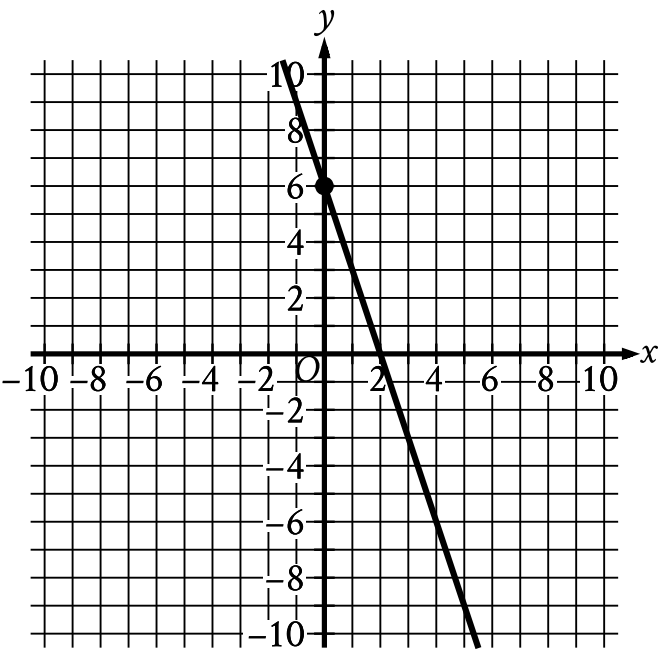
Choice D is incorrect. The length, in centimeters, of one of the two sides of equal length is x , not 37 .

Question Difficulty: Medium

Question ID 8a1fb433

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

ID: 8a1fb433



The graph shows a linear relationship between x and y . Which equation represents this relationship, where R is a positive constant?

- A. $Rx + 18y = 36$
- B. $Rx - 18y = -36$
- C. $18x + Ry = 36$
- D. $18x - Ry = -36$

ID: 8a1fb433 Answer

Correct Answer: C

Rationale

Choice C is correct. The equation representing the linear relationship shown can be written in slope-intercept form $y = mx + b$, where m is the slope and $(0, b)$ is the y-intercept of the line. The line shown passes through the points $(0, 6)$ and $(2, 0)$. Given two points on a line, (x_1, y_1) and (x_2, y_2) , the slope of the line can be calculated using the equation $m = \frac{y_2 - y_1}{x_2 - x_1}$. Substituting $(0, 6)$ and $(2, 0)$ for (x_1, y_1) and (x_2, y_2) , respectively, in this equation yields $m = \frac{0 - 6}{2 - 0}$, which is equivalent to $m = -\frac{6}{2}$, or $m = -3$. Since $(0, 6)$ is the y-intercept, it follows that $b = 6$. Substituting -3 for m and 6 for b in the equation $y = mx + b$ yields $y = -3x + 6$. Adding $3x$ to both sides of this equation yields $3x + y = 6$.

Multiplying this equation by 6 yields $18x + 6y = 36$. It follows that the equation $18x + Ry = 36$, where R is a positive constant, represents this relationship.

Choice A is incorrect. The graph of this relationship passes through the point $(0, 2)$, not $(0, 6)$.

Choice B is incorrect. The graph of this relationship passes through the point $(0, 2)$, not $(0, 6)$.

Choice D is incorrect. The graph of this relationship passes through the point $(-2, 0)$, not $(2, 0)$.

Question Difficulty: Hard