



Question Bank

Math

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Systems of Linear Equations (key)



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Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	■ □ □

ID: b86123af

Hiro and Sofia purchased shirts and pants from a store. The price of each shirt purchased was the same and the price of each pair of pants purchased was the same. Hiro purchased 4 shirts and 2 pairs of pants for \$86, and Sofia purchased 3 shirts and 5 pairs of pants for \$166. Which of the following systems of linear equations represents the situation, if x represents the price, in dollars, of each shirt and y represents the price, in dollars, of each pair of pants?

- A. $4x + 2y = 86$
 $3x + 5y = 166$
- B. $4x + 3y = 86$
 $2x + 5y = 166$
- C. $4x + 2y = 166$
 $3x + 5y = 86$
- D. $4x + 3y = 166$
 $2x + 5y = 86$

ID: b86123af Answer

Correct Answer: A

Rationale

Choice A is correct. Hiro purchased 4 shirts and each shirt cost x dollars, so he spent a total of $4x$ dollars on shirts. Likewise, Hiro purchased 2 pairs of pants, and each pair of pants cost y dollars, so he spent a total of $2y$ dollars on pants. Therefore, the total amount that Hiro spent was $4x + 2y$. Since Hiro spent \$86 in total, this can be modeled by the equation $4x + 2y = 86$. Using the same reasoning, Sofia bought 3 shirts at x dollars each and 5 pairs of pants at y dollars each, so she spent a total of $3x + 5y$ dollars on shirts and pants. Since Sofia spent \$166 in total, this can be modeled by the equation $3x + 5y = 166$.

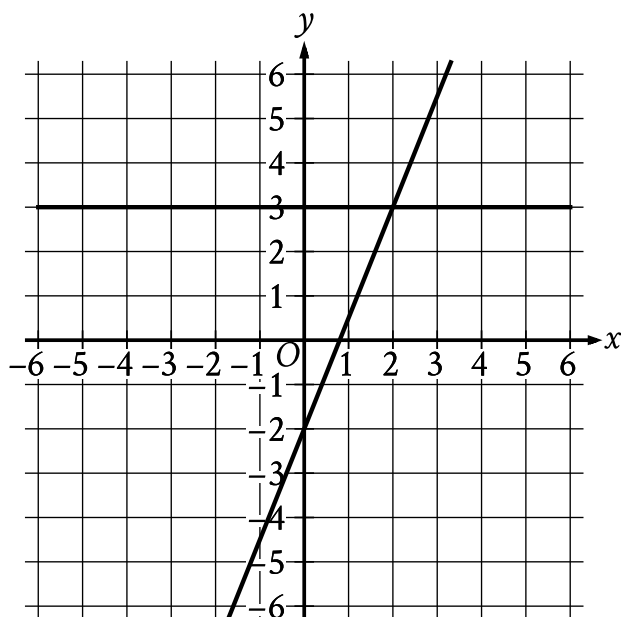
Choice B is incorrect and may be the result of switching the number of shirts Sofia purchased with the number of pairs of pants Hiro purchased. Choice C is incorrect and may be the result of switching the total price each person paid. Choice D is incorrect and may be the result of switching the total price each person paid as well as switching the number of shirts Sofia purchased with the number of pairs of pants Hiro purchased.

Question Difficulty: Easy



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	■ □ □

ID: b0fc3166



The graph of a system of linear equations is shown. What is the solution (x, y) to the system?

- A. $(0, 3)$
- B. $(1, 3)$
- C. $(2, 3)$
- D. $(3, 3)$

ID: b0fc3166 Answer

Correct Answer: C

Rationale

Choice C is correct. The solution to this system of linear equations is represented by the point that lies on both lines shown, or the point of intersection of the two lines. According to the graph, the point of intersection occurs when $x = 2$ and $y = 3$, or at the point $(2, 3)$. Therefore, the solution (x, y) to the system is $(2, 3)$.

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.





Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	<div><div></div><div></div><div></div></div>

ID: dba8d38a

A petting zoo sells two types of tickets. The standard ticket, for admission only, costs \$5. The premium ticket, which includes admission and food to give to the animals, costs \$12. One Saturday, the petting zoo sold a total of 250 tickets and collected a total of \$2,300 from ticket sales. Which of the following systems of equations can be used to find the number of standard tickets, s , and premium tickets, p , sold on that Saturday?

A.
$$\begin{aligned}s + p &= 250 \\ 5s + 12p &= 2,300\end{aligned}$$

B.
$$\begin{aligned}s + p &= 250 \\ 12s + 5p &= 2,300\end{aligned}$$

C.
$$\begin{aligned}5s + 12p &= 250 \\ s + p &= 2,300\end{aligned}$$

D.
$$\begin{aligned}12s + 5p &= 250 \\ s + p &= 2,300\end{aligned}$$

ID: dba8d38a Answer

Correct Answer: A

Rationale

Choice A is correct. It's given that the petting zoo sells two types of tickets, standard and premium, and that s represents the number of standard tickets sold and p represents the number of premium tickets sold. It's also given that the petting zoo sold 250 tickets on one Saturday; thus, $s + p = 250$. It's also given that each standard ticket costs \$5 and each premium ticket costs \$12. Thus, the amount collected in ticket sales can be represented by $5s$ for standard tickets and $12p$ for premium tickets. On that Saturday the petting zoo collected a total of \$2,300 from ticket sales; thus, $5s + 12p = 2,300$. These two equations are correctly represented in choice A.

Choice B is incorrect. The second equation in the system represents the cost per standard ticket as \$12, not \$5, and the cost per premium ticket as \$5, not \$12. Choices C and D are incorrect. The equations represent the total collected from standard and premium ticket sales as \$250, not \$2,300, and the total number of standard and premium tickets sold as \$2,300, not \$250. Additionally, the first equation in choice D represents the cost per standard ticket as \$12, not \$5, and the cost per premium ticket as \$5, not \$12.

Question Difficulty: Easy





Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	<div><div></div><div></div><div></div></div>

ID: aff28230

$$\begin{aligned}x &= 10 \\ y &= x + 21\end{aligned}$$

The solution to the given system of equations is (x, y) . What is the value of y ?

- A. 2.1
- B. 10
- C. 21
- D. 31

ID: aff28230 Answer

Correct Answer: D

Rationale

Choice D is correct. It's given by the first equation in the given system of equations that $x = 10$. Substituting 10 for x in the second equation in the given system yields $y = 10 + 21$, or $y = 31$. Therefore, the value of y is 31.

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

Choice B is incorrect. This is the value of x , not the value of y .

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

Question Difficulty: Easy



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	<div><div></div><div></div><div></div></div>

ID: 8abed0fb

$$y = 2x + 3$$

$$x = 1$$

What is the solution (x, y) to the given system of equations?

- A. $(1, 2)$
- B. $(1, 5)$
- C. $(2, 3)$
- D. $(2, 7)$

ID: 8abed0fb Answer

Correct Answer: B

Rationale

Choice B is correct. Since it's given that $x = 1$, substituting 1 for x in the first equation yields $y = 2(1) + 3$. Simplifying the right-hand side of this equation yields $y = 2 + 3$, or $y = 5$. Therefore, the ordered pair $(1, 5)$ is a solution to the given system of equations.

Choice A is incorrect and may result from a calculation error when substituting 1 for x in the first equation. Choices C and D are incorrect. Because it's given that $x = 1$, x cannot equal 2 as stated in these ordered pairs.

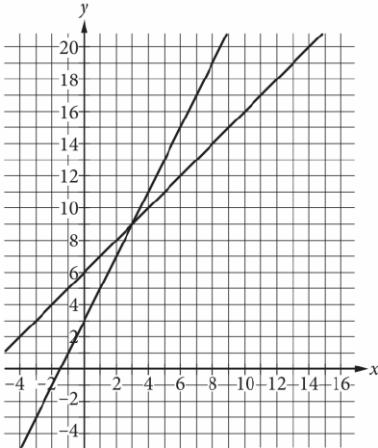
Question Difficulty: Easy



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	<div> <div></div> <div></div> <div></div> </div>

ID: e1259a5a

A system of two linear equations is graphed in the xy -plane below.



Which of the following points is the solution to the system of equations?

- A. (3,9)
- B. (6,15)
- C. (8,10)
- D. (12,18)

ID: e1259a5a Answer

Correct Answer: A

Rationale

Choice A is correct. The solution to this system of linear equations is the point that lies on both lines graphed, or the point of intersection of the two lines. According to the graphs, the point of intersection occurs when $x = 3$ and $y = 9$, or at the point (3,9).

Choices B and D are incorrect. Each of these points lies on one line, but not on both lines in the xy -plane. Choice C is incorrect. This point doesn't lie on either of the lines graphed in the xy -plane.

Question Difficulty: Easy



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	<div><div></div><div></div><div></div></div>

ID: ca9bb527

$$y = 4x - 9$$

$$y = 19$$

What is the solution (x, y) to the given system of equations?

- A. $(4, 19)$
- B. $(7, 19)$
- C. $(19, 4)$
- D. $(19, 7)$

ID: ca9bb527 Answer

Correct Answer: B

Rationale

Choice B is correct. It's given by the second equation in the system that $y = 19$. Substituting **19** for y in the first equation yields $19 = 4x - 9$. Adding **9** to both sides of this equation yields $28 = 4x$. Dividing both sides of this equation by **4** yields $7 = x$. Therefore, since $x = 7$ and $y = 19$, the solution (x, y) to the given system of equations is $(7, 19)$.

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



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	<div><div></div><div></div><div></div></div>

ID: ece00725

Connor has c dollars and Maria has m dollars. Connor has 4 times as many dollars as Maria, and together they have a total of \$25.00. Which system of equations represents this situation?

- A. $c = 4m$
 $c + m = 25$
- B. $m = 4c$
 $c + m = 25$
- C. $c = 25m$
 $c + m = 4$
- D. $m = 25c$
 $c + m = 4$

ID: ece00725 Answer

Correct Answer: A

Rationale

Choice A is correct. It's given that Connor has c dollars, Maria has m dollars, and Connor has 4 times as many dollars as Maria. This can be represented by the equation $c = 4m$. It's also given that together, Connor and Maria have a total of \$25.00, which can be represented by the equation $c + m = 25$. Therefore, the system consisting of the equations $c = 4m$ and $c + m = 25$ represents this situation.

Choice B is incorrect. The equation $m = 4c$ represents a situation where Maria has 4 times as many dollars as Connor, rather than the situation where Connor has 4 times as many dollars as Maria.

Choice C is incorrect. The equation $c = 25m$ represents a situation where Connor has 25 times, rather than 4 times, as many dollars as Maria. The equation $c + m = 4$ represents a situation where Connor and Maria together have a total of \$4.00, rather than \$25.00.

Choice D is incorrect. The equation $m = 25c$ represents a situation where Maria has 25 times as many dollars as Connor, rather than the situation where Connor has 4 times as many dollars as Maria. The equation $c + m = 4$ represents a situation where Connor and Maria together have a total of \$4.00, rather than \$25.00.

Question Difficulty: Easy



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	<div><div></div><div></div><div></div></div>

ID: ee031767

A dance teacher ordered outfits for students for a dance recital. Outfits for boys cost \$26, and outfits for girls cost \$35. The dance teacher ordered a total of 28 outfits and spent \$881. If b represents the number of outfits the dance teacher ordered for boys and g represents the number of outfits the dance teacher ordered for girls, which of the following systems of equations can be solved to find b and g ?

- A.
$$\begin{aligned} 26b + 35g &= 28 \\ b + g &= 881 \end{aligned}$$
- B.
$$\begin{aligned} 26b + 35g &= 881 \\ b + g &= 28 \end{aligned}$$
- C.
$$\begin{aligned} 26g + 35b &= 28 \\ b + g &= 881 \end{aligned}$$
- D.
$$\begin{aligned} 26g + 35b &= 881 \\ b + g &= 28 \end{aligned}$$

ID: ee031767 Answer

Correct Answer: B

Rationale

Choice B is correct. Outfits for boys cost \$26 each and the teacher ordered b outfits for boys, so the teacher spent $26b$ dollars on outfits for boys. Similarly, outfits for girls cost \$35 each and the teacher ordered g outfits for girls, so the teacher spent $35g$ dollars on outfits for girls. Since the teacher spent a total of \$881 on outfits for boys and girls, the equation $26b + 35g = 881$ must be true. And since the teacher ordered a total of 28 outfits, the equation $b + g = 28$ must also be true.

Choice A is incorrect and may result from switching the constraint on the total number of outfits with the constraint on the cost of the outfits. Choice C is incorrect and may result from switching the constraint on the total number of outfits with the constraint on the cost of the outfits, as well as switching the cost of the outfits for boys with the cost of the outfits for girls. Choice D is incorrect and may result from switching the cost of the outfits for boys with the cost of the outfits for girls.

Question Difficulty: Easy



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	■ □ □

ID: cd33b015

$$x + y = 20$$

$$2(x + y) + 3y = 85$$

If (x, y) is the solution to the given system of equations, what is the value of y ?

- A. 10
- B. 15
- C. 60
- D. 65

ID: cd33b015 Answer

Correct Answer: B

Rationale

Choice B is correct. Substituting 20 for $x + y$ in the second equation in the system yields $2(20) + 3y = 85$, or $40 + 3y = 85$. Subtracting 40 from both sides of this equation yields $3y = 45$. Dividing both sides of this equation by 3 yields $y = 15$.

Choice A is incorrect. If $y = 10$, then $x = 10$ since $x + y = 20$. However, substituting 10 for both x and y in the second equation yields $70 = 85$, which is a false statement. Choice C is incorrect. If $y = 60$, then $x = -40$ since $x + y = 20$. However, substituting these values for x and y in the second equation yields $220 = 85$, which is a false statement. Choice D is incorrect. If $y = 65$, then $x = -45$ since $x + y = 20$. However, substituting these values for x and y in the second equation yields $235 = 85$, which is a false statement.

Question Difficulty: Easy



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	<div><div></div><div></div><div></div></div>

ID: 0d1dca87

$$3x + y = 29$$

$$x = 2$$

If (x, y) is the solution to the given system of equations, what is the value of y ?

ID: 0d1dca87 Answer

Rationale

The correct answer is 23. Since it's given that $x = 2$, the value of y can be found by substituting 2 for x in the first equation and solving for y . Substituting 2 for x yields $3(2) + y = 29$, or $6 + y = 29$. Subtracting 6 from both sides of this equation yields $y = 23$.

Question Difficulty: Easy



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	<div><div></div><div></div><div></div></div>

ID: 0df106df

An online bookstore sells novels and magazines. Each novel sells for \$4, and each magazine sells for \$1. If Sadie purchased a total of 11 novels and magazines that have a combined selling price of \$20, how many novels did she purchase?

- A. 2
- B. 3
- C. 4
- D. 5

ID: 0df106df Answer

Correct Answer: B

Rationale

Choice B is correct. Let n be the number of novels and m be the number of magazines that Sadie purchased. If Sadie purchased a total of 11 novels and magazines, then $n + m = 11$. It is given that the combined price of 11 novels and magazines is \$20. Since each novel sells for \$4 and each magazine sells for \$1, it follows that $4n + m = 20$. So the system of equations below must hold.

$$\begin{aligned}4n + m &= 20 \\ n + m &= 11\end{aligned}$$

Subtracting corresponding sides of the second equation from the first equation yields $3n = 9$, so $n = 3$. Therefore, Sadie purchased 3 novels.

Choice A is incorrect. If 2 novels were purchased, then a total of \$8 was spent on novels. That leaves \$12 to be spent on magazines, which means that 12 magazines would have been purchased. However, Sadie purchased a total of 11 novels and magazines. Choices C and D are incorrect. If 4 novels were purchased, then a total of \$16 was spent on novels. That leaves \$4 to be spent on magazines, which means that 4 magazines would have been purchased. By the same logic, if Sadie purchased 5 novels, she would have no money at all (\$0) to buy magazines. However, Sadie purchased a total of 11 novels and magazines.

Question Difficulty: Easy



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	■ □ □

ID: 7d89376f

A discount airline sells a certain number of tickets, x , for a flight for \$90 each. It sells the number of remaining tickets, y , for \$250 each. For a particular flight, the airline sold 120 tickets and collected a total of \$27,600 from the sale of those tickets. Which system of equations represents this relationship between x and y ?

- A. $\begin{cases} x + y = 120 \\ 90x + 250y = 27,600 \end{cases}$
- B. $\begin{cases} x + y = 120 \\ 90x + 250y = 120(27,600) \end{cases}$
- C. $\begin{cases} x + y = 27,600 \\ 90x + 250y = 120(27,600) \end{cases}$
- D. $\begin{cases} 90x = 250y \\ 120x + 120y = 27,600 \end{cases}$

ID: 7d89376f Answer

Correct Answer: A

Rationale

Choice A is correct. The airline sold two types of tickets for this flight: x tickets at \$90 each and the remaining tickets, y , at \$250 each. Because the airline sold a total of 120 tickets for this flight, it must be true that $x + y = 120$. The amount, in dollars, collected from the sale of x tickets at \$90 each is represented by $90x$. The amount, in dollars, collected from the sale of the remaining y tickets at \$250 each is represented by $250y$. It is given that a total of \$27,600 was collected from the sale of all tickets. Therefore, it must also be true that $90x + 250y = 27,600$.

Choice B is incorrect. The total number of tickets sold is represented correctly as $x + y = 120$. The total amount, in dollars, collected from the sale of the x tickets at \$90 each and the remaining tickets, y , at \$250 has been correctly represented as $90x + 250y$. However, according to the information given, this total should be equal to 27,600, not $120(27,600)$ dollars. Choice C is incorrect. The total number of tickets sold has been correctly represented as $x + y$. However, according to the information given, this total should be equal to 120, not 27,600, as shown in choice C. The total amount, in dollars, collected from the sale of the x tickets at \$90 each and the remaining tickets, y , at \$250 has been correctly represented as $90x + 250y$. However, according to the information given, this total should be equal to 27,600, not $120(27,600)$ dollars. Choice D is incorrect. The two equations given in choice D have no meaning in this context.





Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	<div><div></div><div></div><div></div></div>

ID: 17f176ec

A movie theater charges \$11 for each full-price ticket and \$8.25 for each reduced-price ticket. For one movie showing, the theater sold a total of 214 full-price and reduced-price tickets for \$2,145. Which of the following systems of equations could be used to determine the number of full-price tickets, f , and the number of reduced-price tickets, r , sold?

- A. $f + r = 2,145$
 $11f + 8.25r = 214$
- B. $f + r = 214$
 $11f + 8.25r = 2,145$
- C. $f + r = 214$
 $8.25f + 11r = 2,145$
- D. $f + r = 2,145$
 $8.25f + 11r = 214$

ID: 17f176ec Answer

Correct Answer: B

Rationale

Choice B is correct. The movie theater sells f full-price tickets and r reduced-price tickets, so the total number of tickets sold is $f + r$. Since the movie theater sold a total of 214 full-price and reduced-price tickets for one movie showing, it follows that $f + r = 214$. The movie theater charges \$11 for each full-price ticket; thus, the sales for full-price tickets, in dollars, is given by $11f$. The movie theater charges \$8.25 for each reduced-price ticket; thus, the sales for reduced-price tickets, in dollars, is given by $8.25r$. Therefore, the total sales, in dollars, for the movie showing is given by $11f + 8.25r$. Since the total sales for all full-price and reduced-price tickets is \$2,145, it follows that $11f + 8.25r = 2,145$.

Choice A is incorrect. This system of equations suggests that the movie theater sold a total of 2,145 full-price and reduced-price tickets for a total of \$214. Choice C is incorrect. This system suggests that the movie theater charges \$8.25 for each full-price ticket and \$11 for each reduced-price ticket. Choice D is incorrect. This system suggests that the movie theater charges \$8.25 for each full-price ticket and \$11 for each reduced-price ticket and sold a total of 2,145 tickets for a total of \$214.

Question Difficulty: Easy



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	<div><div></div><div></div><div></div></div>

ID: 44d65912

Angela is playing a video game. In this game, players can score points only by collecting coins and stars. Each coin is worth c points, and each star is worth s points.

- The first time she played, Angela scored 700 points. She collected 20 coins and 10 stars.
- The second time she played, Angela scored 850 points. She collected 25 coins and 12 stars.

Which system of equations can be used to correctly determine the values of c and s ?

- A. $10c + 20s = 700$
 $12c + 25s = 850$
- B. $20c + 10s = 700$
 $25c + 12s = 850$
- C. $20c + 700s = 10$
 $25c + 850s = 12$
- D. $700c + 20s = 10$
 $850c + 25s = 12$

ID: 44d65912 Answer

Correct Answer: B

Rationale

Choice B is correct. The number of coins collected can be multiplied by c to give the score from the points earned from coins. Similarly, the number of stars collected can be multiplied by s to give the score from the points earned from the stars. Therefore, the total score each time Angela played is $20c + 10s = 700$, and the total score the second time she played is $25c + 12s = 850$.

Choices A, C, and D are incorrect and may result from misidentifying the terms of the equation. Choice A switches coins and stars, choice C switches stars and points, and choice D misidentifies coins, stars, and points.

Question Difficulty: Easy



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	<div><div></div><div></div><div></div></div>

ID: 4b76c7f1

$$2x + 7y = 9$$

$$8x + 28y = a$$

In the given system of equations, a is a constant. If the system has infinitely many solutions, what is the value of a ?

- A. 4
- B. 9
- C. 36
- D. 54

ID: 4b76c7f1 Answer

Correct Answer: C

Rationale

Choice C is correct. A system of two linear equations has infinitely many solutions if one equation is equivalent to the other. This means that when the two equations are written in the same form, each coefficient or constant in one equation is equal to the corresponding coefficient or constant in the other equation multiplied by the same number. The equations in the given system of equations are written in the same form, with x and y on the left-hand side of the equation and a constant on the right-hand side of the equation. The coefficients of x and y in the second equation are equal to the coefficients of x and y , respectively, in the first equation multiplied by 4: $8 = 2(4)$ and $28 = 7(4)$. Therefore, the constant in the second equation must be equal to 4 times the constant in the first equation: $a = 9(4)$, or $a = 36$.

Choices A, B, and D are incorrect. When $a = 4$, $a = 9$, or $a = 54$, the given system of equations has no solution.

Question Difficulty: Easy



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	■ ■ □

ID: cb8f449f

$$\frac{1}{2}y = 4$$

$$x - \frac{1}{2}y = 2$$

The system of equations above has solution (x, y) . What is the value of x ?

A. 3

B. $\frac{7}{2}$

C. 4

D. 6

ID: cb8f449f Answer

Correct Answer: D

Rationale

Choice D is correct. Adding the corresponding sides of the two equations eliminates y and yields $x = 6$, as shown.

$$\begin{array}{r}
 \frac{1}{2}y = 4 \\
 x - \frac{1}{2}y = 2 \\
 \hline
 x + 0 = 6
 \end{array}$$

If (x, y) is a solution to the system, then (x, y) satisfies both equations in the system and any equation derived from them. Therefore, $x = 6$.

Choices A, B, and C are incorrect and may be the result of errors when solving the system.



Question Difficulty: Medium



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	■ ■ □

ID: 71189542

A group of 202 people went on an overnight camping trip, taking 60 tents with them. Some of the tents held 2 people each, and the rest held 4 people each. Assuming all the tents were filled to capacity and every person got to sleep in a tent, exactly how many of the tents were 2-person tents?

- A. 30
- B. 20
- C. 19
- D. 18

ID: 71189542 Answer

Correct Answer: C

Rationale

Choice C is correct. Let x represent the number of 2-person tents and let y represent the number of 4-person tents. It is given that the total number of tents was 60 and the total number of people in the group was 202. This situation can be expressed as a system of two equations, $x + y = 60$ and $2x + 4y = 202$. The first equation can be rewritten as $y = -x + 60$. Substituting $-x + 60$ for y in the equation $2x + 4y = 202$ yields $2x + 4(-x + 60) = 202$. Distributing and combining like terms gives $-2x + 240 = 202$. Subtracting 240 from both sides of $-2x + 240 = 202$ and then dividing both sides by -2 gives $x = 19$. Therefore, the number of 2-person tents is 19.

Alternate approach: If each of the 60 tents held 4 people, the total number of people that could be accommodated in tents would be 240. However, the actual number of people who slept in tents was 202. The difference of 38 accounts for the 2-person tents. Since each of these tents holds 2 people fewer than a 4-person tent, $\frac{38}{2} = 19$ gives the number of 2-person tents.

Choice A is incorrect. This choice may result from assuming exactly half of the tents hold 2 people. If that were true, then the total number of people who slept in tents would be $2(30) + 4(30) = 180$; however, the total number of people who slept in tents was 202, not 180. Choice B is incorrect. If 20 tents were 2-person tents, then the remaining 40 tents would be 4-person tents. Since all the tents were filled to capacity, the total number of people who slept in tents would be $2(20) + 4(40) = 40 + 160 = 200$; however, the total number of people who slept in tents was 202, not 200. Choice D is incorrect. If 18 tents were 2-person tents, then the

remaining 42 tents would be 4-person tents. Since all the tents were filled to capacity, the total number of people who slept in tents would be $2(18) + 4(42) = 36 + 168 = 204$; however, the total number of people who slept in tents was 202, not 204.

Question Difficulty: Medium



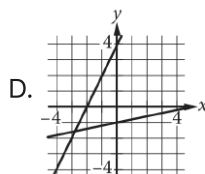
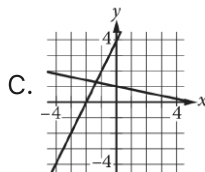
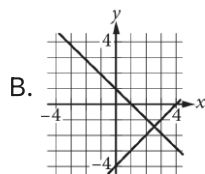
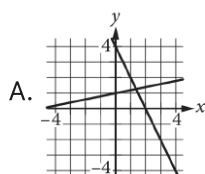
Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	<div> <div></div> <div></div> <div></div> </div>

ID: 6e6a3241

$$x + 5y = 5$$

$$2x - y = -4$$

Which of the following graphs in the xy -plane could be used to solve the system of equations above?



ID: 6e6a3241 Answer

Correct Answer: C

Rationale

Choice C is correct. The graph of a system of equations is the graph that shows the lines represented by each of the equations in the system. The x -intercept of the graph of each given equation can be found by substituting 0 for y in each equation: $x + 5(0) = 5$, or $x = 5$, and $2x - 0 = -4$, or $x = -2$. The y -intercept of the graph of each equation can be found by substituting 0 for x in each equation: $0 + 5y = 5$, or $y = 1$, and $2(0) - y = -4$ or $y = 4$. Using these x - and y - intercept values, the line that has equation $x + 5y = 5$ passes through the points $(0, 1)$ and $(5, 0)$, and the line that has equation $2x - y = -4$ passes through the points $(0, 4)$

and $(-2,0)$. Only the lines in choice C pass through these points and can be used to solve the given system of equations.



Choices A, B, and D are incorrect. In choices A and B, neither line passes through $(0,1)$ and $(5,0)$ or $(0,4)$ and $(-2,0)$. In choice D, although one line passes through $(0,4)$ and $(-2,0)$ the other line doesn't pass through $(0,1)$ and $(5,0)$.

Question Difficulty: Medium



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	■ ■ □

ID: f5929f7a

$$y = -\frac{1}{9}x$$
$$y = \frac{1}{2}x$$

The solution to the given system of equations is (x, y) . What is the value of x ?

- A. -9
- B. -7
- C. 0
- D. 2

ID: f5929f7a Answer

Correct Answer: C

Rationale

Choice C is correct. It's given by the first equation in the system that $y = -\frac{1}{9}x$. Substituting $-\frac{1}{9}x$ for y in the second equation in the system yields $-\frac{1}{9}x = \frac{1}{2}x$. Multiplying the left-hand side of this equation by $\frac{2}{2}$ and the right-hand side by $\frac{9}{9}$ yields $-\frac{2}{18}x = \frac{9}{18}x$. Adding $\frac{2}{18}x$ to both sides of this equation yields $0 = \frac{11}{18}x$. Multiplying both sides of this equation by $\frac{18}{11}$ yields $x = 0$.

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

Question Difficulty: Medium



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	■ ■ □

ID: ed92fb68

$$4x + 5y = 100$$

$$5x + 4y = 62$$

If the system of equations above has solution (x, y) ,
what is the value of $x + y$?

- A. 0
- B. 9
- C. 18
- D. 38

ID: ed92fb68 Answer

Correct Answer: C

Rationale

Choice C is correct. Adding the given equations yields $9x + 9y = 162$. Dividing each side of the equation $9x + 9y = 162$ by 9 gives $x + y = 18$.

Choice A is incorrect and may result from incorrectly adding the equations. Choice B is incorrect and may result from conceptual or computational errors. Choice D is incorrect. This value is equivalent to $y - x$.

Question Difficulty: Medium



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	■ ■ □

ID: 19fdf387

In the xy -plane, the graph of $y = x + 3$ intersects the graph of $y = 2x - 6$ at the point (a, b) . What is the value of a ?

- A. 3
- B. 6
- C. 9
- D. 12

ID: 19fdf387 Answer

Correct Answer: C

Rationale

Choice C is correct. Since the graph of $y = x + 3$ intersects the graph of $y = 2x - 6$ at the point (a, b) , the ordered pair (a, b) is the solution to the system of linear equations consisting of $y = x + 3$ and $y = 2x - 6$, and the value of a is the value of x in the solution of this system. Since both $x + 3$ and $2x - 6$ are equal to y , it follows that $x + 3 = 2x - 6$. Subtracting x from and adding 6 to both sides of the equation yields $9 = x$. Therefore, the value of a is 9.

Choices A and B are incorrect and may result from a calculation or conceptual error in solving the system of equations consisting of $y = x + 3$ and $y = 2x - 6$. Choice D is incorrect. This is the value of b , not a .

Question Difficulty: Medium



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	■ ■ □

ID: c5082ce3

The score on a trivia game is obtained by subtracting the number of incorrect answers from twice the number of correct answers. If a player answered 40 questions and obtained a score of 50, how many questions did the player answer correctly?

ID: c5082ce3 Answer

Rationale

The correct answer is 30. Let x represent the number of correct answers from the player and y represent the number of incorrect answers from the player. Since the player answered 40 questions in total, the equation $x + y = 40$ represents this situation. Also, since the score is found by subtracting the number of incorrect answers from twice the number of correct answers and the player received a score of 50, the equation $2x - y = 50$ represents this situation. Adding the equations in the system of two equations together yields $(x + y) + (2x - y) = 40 + 50$. This can be rewritten as $3x = 90$. Finally, solving for x by dividing both sides of the equation by 3 yields $x = 30$.

Question Difficulty: Medium



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	■ ■ □

ID: 092ad67d

$$x + 2y = 6$$

$$x - 2y = 4$$

The solution to the given system of equations is (x, y) . What is the value of x ?

- A. 2.5
- B. 5
- C. 6
- D. 10

ID: 092ad67d Answer

Correct Answer: B

Rationale

Choice B is correct. Adding the first equation to the second equation in the given system yields $(x + 2y) + (x - 2y) = 6 + 4$, or $(x + x) + (2y - 2y) = 10$. Combining like terms in this equation yields $2x = 10$. Dividing both sides of this equation by 2 yields $x = 5$. Thus, the value of x is 5.

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. This is the value of $2x$, not x .

Question Difficulty: Medium



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	■ ■ □

ID: e77a76ce

Which of the following systems of linear equations has no solution?

- A. $y = 6x + 3$
 $y = 6x + 9$
- B. $y = 10$
 $y = 10x + 10$
- C. $y = 14x + 14$
 $y = 10x + 14$
- D. $x = 3$
 $y = 10$

ID: e77a76ce Answer

Correct Answer: A

Rationale

Choice A is correct. A system of two linear equations in two variables, x and y , has no solution if the graphs of the lines represented by the equations in the xy -plane are distinct and parallel. The graphs of two lines in the xy -plane represented by equations in slope-intercept form, $y = mx + b$, where m and b are constants, are parallel if their slopes, m , are the same and are distinct if their y -coordinates of the y -intercepts, b , are different. In the equations $y = 6x + 3$ and $y = 6x + 9$, the values of m are each 6, and the values of b are 3 and 9, respectively. Since the slopes of these lines are the same and the y -coordinates of the y -intercepts are different, it follows that the system of linear equations in choice A has no solution.

Choice B is incorrect. The two lines represented by these equations are a horizontal line and a line with a slope of 10 that have the same y -coordinate of the y -intercept. Therefore, this system has a solution, $(0, 10)$, rather than no solution.

Choice C is incorrect. The two lines represented by these equations have different slopes and the same y -coordinate of the y -intercept. Therefore, this system has a solution, $(0, 14)$, rather than no solution.

Choice D is incorrect. The two lines represented by these equations are a vertical line and a horizontal line. Therefore, this system has a solution, $(3, 10)$, rather than no solution.

Question Difficulty: Medium



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	■ ■ □

ID: 5e422ff9

$$y = 2x - 3$$

$$3y = 5x$$

In the solution to the system of equations above, what is the value of y ?

- A. -15
- B. -9
- C. 9
- D. 15

ID: 5e422ff9 Answer

Correct Answer: D

Rationale

Choice D is correct. Multiplying both sides of $y = 2x - 3$ by 5 results in $5y = 10x - 15$. Multiplying both sides of $3y = 5x$ by 2 results in $6y = 10x$. Subtracting the resulting equations yields $5y - 6y = (10x - 15) - (10x)$, which simplifies to $-y = -15$. Dividing both sides of $-y = -15$ by -1 results in $y = 15$.

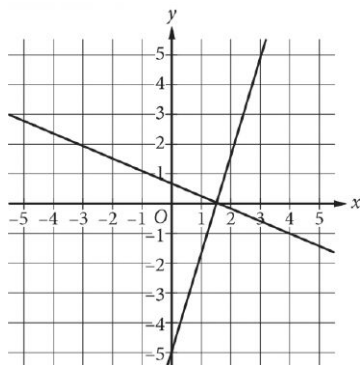
Choices A and B are incorrect and may result from incorrectly subtracting the transformed equation. Choice C is incorrect and may result from finding the value of x instead of the value of y .

Question Difficulty: Medium



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	■ ■ □

ID: 2704399f



Which of the following systems of equations has the same solution as the system of equations graphed above?

- $y = 0$
 A. $x = \frac{3}{2}$
 $y = \frac{3}{2}$
 B. $x = 0$
 $y = 0$
 C. $x = 1$
 $y = 1$
 D. $x = 0$

ID: 2704399f Answer

Correct Answer: A

Rationale

Choice A is correct. The solution to a system of equations is the coordinates of the intersection point of the graphs of the equations in the xy -plane. Based on the graph, the solution to the given system of equations is

best approximated as $(\frac{3}{2}, 0)$. In the xy -plane, the graph of $y = 0$ is a horizontal line on which every y -

coordinate is 0, and the graph of $x = \frac{3}{2}$ is a vertical line on which every x -coordinate is $\frac{3}{2}$. These graphs

intersect at the point $(\frac{3}{2}, 0)$. Therefore, the system of equations in choice A has the same solution as the given system.

Choices B, C, and D are incorrect. If graphed in the xy-plane, these choices would intersect at the points $(0, \frac{3}{2})$, $(1, 0)$, and $(0, 1)$, respectively, not $(\frac{3}{2}, 0)$.

Question Difficulty: Medium



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	■ ■ □

ID: b544a348

$$5x + 3y = 38$$

$$x + 3y = 10$$

In the solution (x, y) to the system of equations above, what is the value of x ?

ID: b544a348 Answer

Rationale

The correct answer is 7. Subtracting the second equation from the first equation eliminates the variable y .

$$\begin{array}{r} 5x + 3y = 38 \\ -(x + 3y = 10) \\ \hline 4x = 28 \end{array}$$

Dividing both sides of the resulting equation by 4 yields $x = 7$.

Question Difficulty: Medium



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	■ ■ □

ID: e53688cb

$$x + 3y = 29$$

$$3y = 11$$

The solution to the given system of equations is (x, y) . What is the value of x ?

ID: e53688cb Answer

Correct Answer: 18

Rationale

The correct answer is **18**. It's given by the second equation in the system that $3y = 11$. Substituting **11** for $3y$ in the first equation in the system, $x + 3y = 29$, yields $x + 11 = 29$. Subtracting **11** from both sides of this equation yields $x = 18$.

Question Difficulty: Medium



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	■ ■ ■

ID: d1b66ae6

$$-x + y = -3.5$$

$$x + 3y = 9.5$$

If (x, y) satisfies the system of equations above, what is the value of y ?

ID: d1b66ae6 Answer

Rationale

The correct answer is $\frac{3}{2}$. One method for solving the system of equations for y is to add corresponding sides of the two equations. Adding the left-hand sides gives $(-x + y) + (x + 3y)$, or $4y$. Adding the right-hand sides yields $-3.5 + 9.5 = 6$. It follows that $4y = 6$. Finally, dividing both sides of $4y = 6$ by 4 yields $y = \frac{6}{4}$ or $\frac{3}{2}$. Note that $3/2$ and 1.5 are examples of ways to enter a correct answer.

Question Difficulty: Hard



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	■ ■ ■

ID: 70feb725

During a month, Morgan ran r miles at 5 miles per hour and biked b miles at 10 miles per hour. She ran and biked a total of 200 miles that month, and she biked for twice as many hours as she ran. What is the total number of miles that Morgan biked during the month?

- A. 80
- B. 100
- C. 120
- D. 160

ID: 70feb725 Answer

Correct Answer: D

Rationale

Choice D is correct. The number of hours Morgan spent running or biking can be calculated by dividing the distance she traveled during that activity by her speed, in miles per hour, for that activity. So the number of hours she ran can be represented by the expression $\frac{r}{5}$, and the number of hours she biked can be represented by the expression $\frac{b}{10}$. It's given that she biked for twice as many hours as she ran, so this can be represented by the equation $\frac{b}{10} = 2\left(\frac{r}{5}\right)$, which can be rewritten as $b = 4r$. It's also given that she ran r miles and biked b miles, and that she ran and biked a total of 200 miles. This can be represented by the equation $r + b = 200$. Substituting $4r$ for b in this equation yields $r + 4r = 200$, or $5r = 200$. Solving for r yields $r = 40$. Determining the number of miles she biked, b , can be found by substituting 40 for r in $r + b = 200$, which yields $40 + b = 200$. Solving for b yields $b = 160$.

Choices A, B, and C are incorrect because they don't satisfy that Morgan biked for twice as many hours as she ran. In choice A, if she biked 80 miles, then she ran 120 miles, which means she biked for 8 hours and ran for 24 hours. In choice B, if she biked 100 miles, then she ran 100 miles, which means she biked for 10 hours and ran for 20 hours. In choice C, if she biked 120 miles, then she ran for 80 miles, which means she biked for 12 hours and ran for 16 hours.

Question Difficulty: Hard





Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	■ ■ ■

ID: e1248a5c

In the system of equations below, a and c are constants.

$$\frac{1}{2}x + \frac{1}{3}y = \frac{1}{6}$$

$$ax + y = c$$

If the system of equations has an infinite number of solutions (x, y) , what is the value of a ?

A. $-\frac{1}{2}$

B. 0

C. $\frac{1}{2}$

D. $\frac{3}{2}$

ID: e1248a5c Answer

Correct Answer: D

Rationale

Choice D is correct. A system of two linear equations has infinitely many solutions if one equation is equivalent to the other. This means that when the two equations are written in the same form, each coefficient or constant in one equation is equal to the corresponding coefficient or constant in the other equation multiplied by the same number. The equations in the given system of equations are written in the same form, with x and y on the left-hand side and a constant on the right-hand side of the equation. The coefficient of y in the second equation is equal to the coefficient of y in the first equation multiplied by 3. Therefore, a , the coefficient of x in the second equation, must be equal to 3 times the coefficient of x in the first equation:

$$a = \left(\frac{1}{2}\right)(3), \text{ or } a = \frac{3}{2}.$$

Choices A, B, and C are incorrect. When $a = -\frac{1}{2}$, $a = 0$, or $a = \frac{1}{2}$, the given system of equations has one solution.

Question Difficulty: Hard



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	■ ■ ■

ID: 52cb8ea4

$$7x - 5y = 4$$

$$4x - 8y = 9$$

If (x, y) is the solution to the system of equations above, what is the value of $3x + 3y$?

- A. -13
- B. -5
- C. 5
- D. 13

ID: 52cb8ea4 Answer

Correct Answer: B

Rationale

Choice B is correct. Subtracting the second equation, $4x - 8y = 9$, from the first equation, $7x - 5y = 4$, results in $(7x - 5y) - (4x - 8y) = 4 - 9$, or $7x - 5y - 4x + 8y = 5$. Combining like terms on the left-hand side of this equation yields $3x + 3y = -5$.

Choice A is incorrect and may result from miscalculating $4 - 9$ as -13 . Choice C is incorrect and may result from miscalculating $4 - 9$ as 5. Choice D is incorrect and may result from adding 9 to 4 instead of subtracting 9 from 4.

Question Difficulty: Hard



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	■ ■ ■

ID: d7bf55e1

A movie theater sells two types of tickets, adult tickets for \$12 and child tickets for \$8. If the theater sold 30 tickets for a total of \$300, how much, in dollars, was spent on adult tickets? (Disregard the \$ sign when gridding your answer.)

ID: d7bf55e1 Answer

Rationale

The correct answer is 180. Let a be the number of adult tickets sold and c be the number of child tickets sold. Since the theater sold a total of 30 tickets, $a + c = 30$. The price per adult ticket is \$12, and the price per child ticket is \$8. Since the theater received a total of \$300 for the 30 tickets sold, it follows that $12a + 8c = 300$. To eliminate c , the first equation can be multiplied by 8 and then subtracted from the second equation:

$$\begin{array}{r} 12a + 8c = 300 \\ -8a - 8c = -240 \\ \hline 4a + 0c = 60 \end{array}$$

Because the question asks for the amount spent on adult tickets, which is $12a$ dollars, the resulting equation can be multiplied by 3 to give $3(4a) = 3(60) = 180$. Therefore, \$180 was spent on adult tickets.

Alternate approach: If all the 30 tickets sold were child tickets, their total price would be $30(\$8) = \240 . Since the actual total price of the 30 tickets was \$300, the extra \$60 indicates that a certain number of adult tickets, a , were sold. Since the price of each adult ticket is \$4 more than each child ticket, $4a = 60$, and it follows that $12a = 180$.

Question Difficulty: Hard



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	■ ■ ■

ID: f718c9cf

$$5x + 14y = 45$$

$$10x + 7y = 27$$

The solution to the given system of equations is (x, y) . What is the value of xy ?

ID: f718c9cf Answer

Correct Answer: 1.8, 9/5

Rationale

The correct answer is $\frac{9}{5}$. Multiplying the first equation in the given system by 2 yields $10x + 28y = 90$. Subtracting the second equation in the given system, $10x + 7y = 27$, from $10x + 28y = 90$ yields $(10x + 28y) - (10x + 7y) = 90 - 27$, which is equivalent to $10x + 28y - 10x - 7y = 63$, or $21y = 63$. Dividing both sides of this equation by 21 yields $y = 3$. The value of x can be found by substituting 3 for y in either of the two given equations. Substituting 3 for y in the equation $10x + 7y = 27$ yields $10x + 7(3) = 27$, or $10x + 21 = 27$. Subtracting 21 from both sides of this equation yields $10x = 6$. Dividing both sides of this equation by 10 yields $x = \frac{6}{10}$, or $x = \frac{3}{5}$. Therefore, the value of xy is $(\frac{3}{5})(3)$, or $\frac{9}{5}$. Note that 9/5 and 1.8 are examples of ways to enter a correct answer.

Question Difficulty: Hard



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	■ ■ ■

ID: 466b87e3

$$y = \frac{1}{2}x + 8$$

$$y = cx + 10$$

In the system of equations above, c is a constant. If the system has no solution, what is the value of c ?

ID: 466b87e3 Answer

Rationale

The correct answer is $\frac{1}{2}$. A system of two linear equations has no solution when the graphs of the equations have the same slope and different y-intercepts. Each of the given linear equations is written in the slope-intercept form, $y = mx + b$, where m is the slope and b is the y-coordinate of the y-intercept of the graph of the equation. For these two linear equations, the y-intercepts are $(0,8)$ and $(0,10)$. Thus, if the system of equations has no solution, the slopes of the graphs of the two linear equations must be the same. The slope of the graph of the first linear equation is $\frac{1}{2}$. Therefore, for the system of equations to have no solution, the value of c must be $\frac{1}{2}$. Note that $1/2$ and $.5$ are examples of ways to enter a correct answer.

Question Difficulty: Hard



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	■ ■ ■

ID: e2e3942f

$$y = 2x + 1$$

$$y = ax - 8$$

In the system of equations above, a is a constant. If the system of equations has no solution, what is the value of a ?

A. $-\frac{1}{2}$

B. 0

C. 1

D. 2

ID: e2e3942f Answer

Correct Answer: D

Rationale

Choice D is correct. A system of two linear equations has no solution when the graphs of the equations have the same slope and different y-coordinates of the y-intercepts. Each of the given equations is written in the slope-intercept form of a linear equation, $y = mx + b$, where m is the slope and b is the y-coordinate of the y-intercept of the graph of the equation. For these two linear equations, the y-coordinates of the y-intercepts are different: **1** and **-8**. Thus, if the system of equations has no solution, the slopes of the two linear equations must be the same. The slope of the first linear equation is 2. Therefore, for the system of equations to have no solution, the value of a must be 2.

Choices A, B, and C are incorrect and may result from conceptual and computational errors.

Question Difficulty: Hard



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	■ ■ ■

ID: 1e11190a

Store A sells raspberries for **\$5.50** per pint and blackberries for **\$3.00** per pint. Store B sells raspberries for **\$6.50** per pint and blackberries for **\$8.00** per pint. A certain purchase of raspberries and blackberries would cost **\$37.00** at Store A or **\$66.00** at Store B. How many pints of blackberries are in this purchase?

- A. 4
- B. 5
- C. 8
- D. 12

ID: 1e11190a Answer

Correct Answer: B

Rationale

Choice C is correct. It's given that store A sells raspberries for **\$5.50** per pint and blackberries for **\$3.00** per pint, and a certain purchase of raspberries and blackberries at store A would cost **\$37.00**. It's also given that store B sells raspberries for **\$6.50** per pint and blackberries for **\$8.00** per pint, and this purchase of raspberries and blackberries at store B would cost **\$66.00**. Let r represent the number of pints of raspberries and b represent the number of pints of blackberries in this purchase. The equation $5.50r + 3.00b = 37.00$ represents this purchase of raspberries and blackberries from store A and the equation $6.50r + 8.00b = 66.00$ represents this purchase of raspberries and blackberries from store B. Solving the system of equations by elimination gives the value of r and the value of b that make the system of equations true. Multiplying both sides of the equation for store A by **6.5** yields $(5.50r)(6.5) + (3.00b)(6.5) = (37.00)(6.5)$, or $35.75r + 19.5b = 240.5$. Multiplying both sides of the equation for store B by **5.5** yields $(6.50r)(5.5) + (8.00b)(5.5) = (66.00)(5.5)$, or $35.75r + 44b = 363$. Subtracting both sides of the equation for store A, $35.75r + 19.5b = 240.5$, from the corresponding sides of the equation for store B, $35.75r + 44b = 363$, yields $(35.75r - 35.75r) + (44b - 19.5b) = (363 - 240.5)$, or $24.5b = 122.5$. Dividing both sides of this equation by **24.5** yields $b = 5$. Thus, **5** pints of blackberries are in this purchase.

Choices A and B are incorrect and may result from conceptual or calculation errors. Choice D is incorrect. This is the number of pints of raspberries, not blackberries, in the purchase.

Question Difficulty: Hard



Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Systems of two linear equations in two variables	■ ■ ■

ID: 567ac7ab

One of the two equations in a linear system is $2x + 6y = 10$. The system has no solution. Which of the following could be the other equation in the system?

- A. $x + 3y = 5$
- B. $x + 3y = -20$
- C. $6x - 2y = 0$
- D. $6x + 2y = 10$

ID: 567ac7ab Answer

Correct Answer: B

Rationale

Choice B is correct. A system of two linear equations written in standard form has no solution when the equations are distinct and the ratio of the x-coefficient to the y-coefficient for one equation is equivalent to the ratio of the x-coefficient to the y-coefficient for the other equation. This ratio for the given equation is 2 to 6, or 1 to 3. Only choice B is an equation that isn't equivalent to the given equation and whose ratio of the x-coefficient to the y-coefficient is 1 to 3.

Choice A is incorrect. Multiplying each of the terms in this equation by 2 yields an equation that is equivalent to the given equation. This system would have infinitely many solutions. Choices C and D are incorrect. The ratio of the x-coefficient to the y-coefficient in $6x - 2y = 0$ (choice C) is -6 to 2, or -3 to 1. This ratio in $6x + 2y = 10$ (choice D) is 6 to 2, or 3 to 1. Since neither of these ratios is equivalent to that for the given equation, these systems would have exactly one solution.

Question Difficulty: Hard