

Question ID d1a81099

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Algebra	Linear inequalities in one or two variables	<div><div></div><div></div><div></div></div>

ID: d1a81099

$y > 4x + 8$

For which of the following tables are all the values of x and their corresponding values of y solutions to the given inequality?

A.

x	y
2	19
4	30
6	41

B.

x	y
2	8
4	16
6	24

C.

x	y
2	13
4	18
6	23

D.

x	y
2	13
4	21
6	29

ID: d1a81099 Answer

Correct Answer: A

Rationale

Choice A is correct. In each choice, the values of x are 2, 4, and 6. Substituting the first value of x , 2, for x in the given inequality yields $y > 42 + 8$, or $y > 16$. Therefore, when $x = 2$, the corresponding value of y must be greater than 16. Of the given choices, only choice A is a table where the value of y corresponding to $x = 2$ is greater than 16. To confirm that the other values of x in this table and their corresponding values of y are also solutions to the given inequality, the values of x and y in the table can be substituted for x and y in the given inequality. Substituting 4 for x and 30 for y in the given inequality yields $30 > 44 + 8$, or $30 > 24$, which is true. Substituting 6 for x and 41 for y in the given inequality yields $41 > 46 + 8$, or $41 > 32$, which is true. It follows that for choice A, all the values of x and their corresponding values of y are solutions to the given inequality.

Choice B is incorrect. Substituting 2 for x and 8 for y in the given inequality yields $8 > 42 + 8$, or $8 > 16$, which is false.

Choice C is incorrect. Substituting 2 for x and 13 for y in the given inequality yields $13 > 42 + 8$, or $13 > 16$, which is false.

Choice D is incorrect. Substituting 2 for x and 13 for y in the given inequality yields $13 > 42 + 8$, or $13 > 16$, which is false.

Question Difficulty: Medium

Question ID 2a58b08a

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Algebra	Linear inequalities in one or two variables	<div><div></div><div></div><div></div></div>

ID: 2a58b08a

For a snowstorm in a certain town, the minimum rate of snowfall recorded was **0.6** inches per hour, and the maximum rate of snowfall recorded was **1.8** inches per hour. Which inequality is true for all values of s , where s represents a rate of snowfall, in inches per hour, recorded for this snowstorm?

- A. $s \geq 2.4$
- B. $s \geq 1.8$
- C. $0 \leq s \leq 0.6$
- D. $0.6 \leq s \leq 1.8$

ID: 2a58b08a Answer

Correct Answer: D

Rationale

Choice D is correct. It's given that for a snowstorm in a certain town, the minimum rate of snowfall recorded was 0.6 inches per hour, the maximum rate of snowfall recorded was 1.8 inches per hour, and s represents a rate of snowfall, in inches per hour, recorded for this snowstorm. It follows that the inequality $0.6 \leq s \leq 1.8$ is true for all values of s .

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 828fbdfc

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Algebra	Linear inequalities in one or two variables	<div><div></div><div></div><div></div></div>

ID: 828fbdfc

A moving truck can tow a trailer if the combined weight of the trailer and the boxes it contains is no more than **4,600** pounds. What is the maximum number of boxes this truck can tow in a trailer with a weight of **500** pounds if each box weighs **120** pounds?

- A. **34**
- B. **35**
- C. **38**
- D. **39**

ID: 828fbdfc Answer

Correct Answer: A

Rationale

Choice A is correct. It's given that the truck can tow a trailer if the combined weight of the trailer and the boxes it contains is no more than 4,600 pounds. If the trailer has a weight of 500 pounds and each box weighs 120 pounds, the expression $500 + 120b$, where b is the number of boxes, gives the combined weight of the trailer and the boxes. Since the combined weight must be no more than 4,600 pounds, the possible numbers of boxes the truck can tow are given by the inequality $500 + 120b \leq 4,600$. Subtracting 500 from both sides of this inequality yields $120b \leq 4,100$. Dividing both sides of this inequality by 120 yields $b \leq \frac{205}{6}$, or b is less than or equal to approximately 34.17. Since the number of boxes, b , must be a whole number, the maximum number of boxes the truck can tow is the greatest whole number less than 34.17, which is 34.

Choice B is incorrect. Towing the trailer and 35 boxes would yield a combined weight of 4,700 pounds, which is greater than 4,600 pounds.

Choice C is incorrect. Towing the trailer and 38 boxes would yield a combined weight of 5,060 pounds, which is greater than 4,600 pounds.

Choice D is incorrect. Towing the trailer and 39 boxes would yield a combined weight of 5,180 pounds, which is greater than 4,600 pounds.

Question Difficulty: Medium

Question ID 7808c7b0

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Algebra	Linear inequalities in one or two variables	<div><div></div><div></div><div></div></div>

ID: 7808c7b0

The point $(8, 2)$ in the xy -plane is a solution to which of the following systems of inequalities?

- A. $x > 0$
 $y > 0$
- B. $x > 0$
 $y < 0$
- C. $x < 0$
 $y > 0$
- D. $x < 0$
 $y < 0$

ID: 7808c7b0 Answer

Correct Answer: A

Rationale

Choice A is correct. The given point, 8, 2, is located in the first quadrant in the xy -plane. The system of inequalities in choice A represents all the points in the first quadrant in the xy -plane. Therefore, 8, 2 is a solution to the system of inequalities in choice A.

Alternate approach: Substituting 8 for x in the first inequality in choice A, $x > 0$, yields $8 > 0$, which is true. Substituting 2 for y in the second inequality in choice A, $y > 0$, yields $2 > 0$, which is true. Since the coordinates of the point 8, 2 make the inequalities $x > 0$ and $y > 0$ true, the point 8, 2 is a solution to the system of inequalities consisting of $x > 0$ and $y > 0$.

Choice B is incorrect. This system of inequalities represents all the points in the fourth quadrant, not the first quadrant, in the xy -plane.

Choice C is incorrect. This system of inequalities represents all the points in the second quadrant, not the first quadrant, in the xy -plane.

Choice D is incorrect. This system of inequalities represents all the points in the third quadrant, not the first quadrant, in the xy -plane.

Question Difficulty: Medium

Question ID 0fef875d

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Algebra	Linear inequalities in one or two variables	<div><div></div><div></div><div></div></div>

ID: 0fef875d

For a party, **50** dinner rolls are needed. Dinner rolls are sold in packages of **12**. What is the minimum number of packages that should be bought for the party?

ID: 0fef875d Answer

Correct Answer: 5

Rationale

The correct answer is 5. Let p represent the number of packages of dinner rolls that should be bought for the party. It's given that dinner rolls are sold in packages of 12. Therefore, $12p$ represents the number of dinner rolls that should be bought for the party. It's also given that 50 dinner rolls are needed; therefore, $12p \geq 50$. Dividing both sides of this inequality by 12 yields $p \geq \frac{50}{12}$, or approximately $p \geq 4.17$. Since the number of packages of dinner rolls must be a whole number, the minimum number of packages that should be bought for the party is 5.

Question Difficulty: Medium

Question ID e28c3fbe

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Algebra	Linear inequalities in one or two variables	<div><div></div><div></div><div></div></div>

ID: e28c3fbe

The length of a rectangle is **50** inches and the width is x inches. The perimeter is at most **210** inches. Which inequality represents this situation?

- A. $2x + 100 \leq 210$
- B. $2x + 100 \geq 210$
- C. $2x + 50 \leq 210$
- D. $2x + 50 \geq 210$

ID: e28c3fbe Answer

Correct Answer: A

Rationale

Choice A is correct. The perimeter of a rectangle is equal to the sum of 2 times its length and 2 times its width. It's given that the rectangle's length is 50 inches and the width is x inches. Therefore, the perimeter, in inches, is $250 + 2x$, or $100 + 2x$, which is equivalent to $2x + 100$. It's given that the perimeter is at most 210 inches; therefore, $2x + 100 \leq 210$ represents this situation.

Choice B is incorrect. This inequality represents a situation where the perimeter is at least, rather than at most, 210 inches.

Choice C is incorrect. This inequality represents a situation where 2 times the length, rather than the length, is 50 inches.

Choice D is incorrect. This inequality represents a situation where 2 times the length, rather than the length, is 50 inches, and the perimeter is at least, rather than at most, 210 inches.

Question Difficulty: Medium

Question ID 0ef62ebb

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Algebra	Linear inequalities in one or two variables	<div><div></div><div></div><div></div></div>

ID: 0ef62ebb

A cleaning service that cleans both offices and homes can clean at most **14** places per day. Which inequality represents this situation, where *f* is the number of offices and *h* is the number of homes?

- A. $f + h \leq 14$
- B. $f + h \geq 14$
- C. $f - h \leq 14$
- D. $f - h \geq 14$

ID: 0ef62ebb Answer

Correct Answer: A

Rationale

Choice A is correct. It's given that the cleaning service cleans both offices and homes, where *f* is the number of offices and *h* is the number of homes the cleaning service can clean per day. Therefore, the expression $f + h$ represents the number of places the cleaning service can clean per day. It's also given that the cleaning service can clean at most 14 places per day. Since $f + h$ represents the number of places the cleaning service can clean per day and the service can clean at most 14 places per day, it follows that the inequality $f + h \leq 14$ represents this situation.

Choice B is incorrect. This inequality represents a cleaning service that cleans at least 14 places per day.

Choice C is incorrect. This inequality represents a cleaning service that cleans at most 14 more offices than homes per day.

Choice D is incorrect. This inequality represents a cleaning service that cleans at least 14 more offices than homes per day.

Question Difficulty: Medium

Question ID ece4e9e6

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Algebra	Linear inequalities in one or two variables	<div><div></div><div></div><div></div></div>

ID: ece4e9e6

On a car trip, Rhett and Jessica each drove for part of the trip, and the total distance they drove was under **220** miles. Rhett drove at an average speed of **35 miles per hour (mph)**, and Jessica drove at an average speed of **40 mph**. Which of the following inequalities represents this situation, where ***r*** is the number of hours Rhett drove and ***j*** is the number of hours Jessica drove?

- A. $35r + 40j > 220$
- B. $35r + 40j < 220$
- C. $40r + 35j > 220$
- D. $40r + 35j < 220$

ID: ece4e9e6 Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that Rhett drove at an average speed of 35 miles per hour and that he drove for *r* hours. Multiplying 35 miles per hour by *r* hours yields $35r$ miles, or the distance that Rhett drove. It's also given that Jessica drove at an average speed of 40 miles per hour and that she drove for *j* hours. Multiplying 40 miles per hour by *j* hours yields $40j$ miles, or the distance that Jessica drove. The total distance, in miles, that Rhett and Jessica drove can be represented by the expression $35r + 40j$. It's given that the total distance they drove was under 220 miles. Therefore, the inequality $35r + 40j < 220$ represents this situation.

Choice A is incorrect. This inequality represents a situation in which the total distance Rhett and Jessica drove was over, rather than under, 220 miles.

Choice C is incorrect. This inequality represents a situation in which Rhett drove at an average speed of 40, rather than 35, miles per hour, Jessica drove at an average speed of 35, rather than 40, miles per hour, and the total distance they drove was over, rather than under, 220 miles.

Choice D is incorrect. This inequality represents a situation in which Rhett drove at an average speed of 40, rather than 35, miles per hour, and Jessica drove at an average speed of 35, rather than 40, miles per hour.

Question Difficulty: Medium

Question ID ec8fc70e

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Algebra	Linear inequalities in one or two variables	<div><div></div><div></div><div></div></div>

ID: ec8fc70e

$$y < -4x + 4$$

Which point (x, y) is a solution to the given inequality in the xy -plane?

- A. $(-4, 0)$
- B. $(0, 5)$
- C. $(2, 1)$
- D. $(2, -1)$

ID: ec8fc70e Answer

Correct Answer: A

Rationale

Choice D is correct. For a point x, y to be a solution to the given inequality in the xy -plane, the value of the point's y -coordinate must be less than the value of $-4x + 4$, where x is the value of the x -coordinate of the point. This is true of the point $-4, 0$ because $0 < -4(-4) + 4$, or $0 < 20$. Therefore, the point $-4, 0$ is a solution to the given inequality.

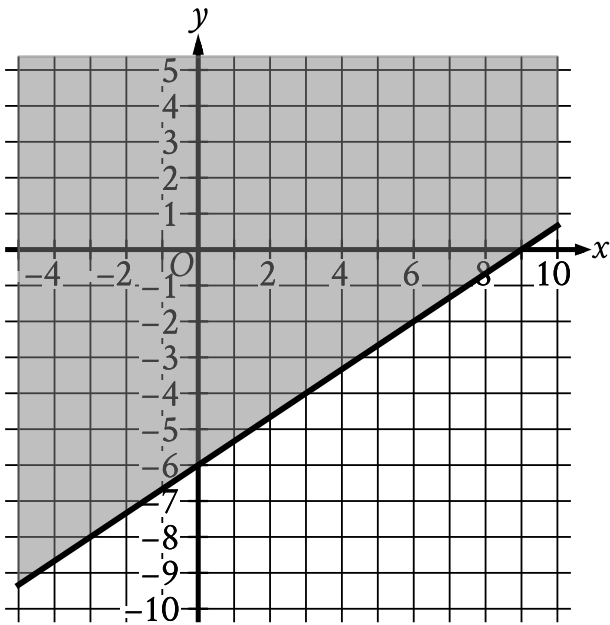
Choices A, B, and C are incorrect. None of these points are a solution to the given inequality because each point's y -coordinate is greater than the value of $-4x + 4$ for the point's x -coordinate.

Question Difficulty: Medium

Question ID a0016bd6

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Algebra	Linear inequalities in one or two variables	<div><div></div><div></div><div></div></div>

ID: a0016bd6



The shaded region shown represents the solutions to which inequality?

- A. $y \geq \frac{2}{3}x - 6$
- B. $y \geq \frac{2}{3}x + 6$
- C. $y \geq \frac{2}{3}x - 9$
- D. $y \geq \frac{2}{3}x + 9$

ID: a0016bd6 Answer

Correct Answer: A

Rationale

Choice A is correct. The equation for the line representing the boundary of the shaded region can be written in slope-intercept form $y = mx + b$, where m is the slope and b is the y -intercept of the line. For the graph shown, the boundary line passes through the points $(0, -6)$ and $(9, 0)$. 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 the points $(0, -6)$ and $(9, 0)$ for (x_1, y_1) and (x_2, y_2) , respectively, in this equation yields $m = \frac{0 - (-6)}{9 - 0}$, which is equivalent to $m = \frac{6}{9}$, or $m = \frac{2}{3}$. Since the point $(0, -6)$ represents the y -intercept, it follows that $b = -6$. Substituting $\frac{2}{3}$ for m and -6 for b in the equation $y = mx + b$ yields $y = \frac{2}{3}x - 6$ as the equation of the boundary line. Since the shaded region represents all the

points on and above this boundary line, it follows that the shaded region shown represents the solutions to the inequality $y \geq \frac{2}{3}x - 6$.

Choice B is incorrect. This inequality represents a region whose boundary line has a y-intercept of 0, 6, not 0, - 6.

Choice C is incorrect. This inequality represents a region whose boundary line has a y-intercept of 0, - 9, not 0, - 6.

Choice D is incorrect. This inequality represents a region whose boundary line has a y-intercept of 0, 9, not 0, - 6.

Question Difficulty: Medium

Question ID 088777da

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Algebra	Linear inequalities in one or two variables	<div><div></div><div></div><div></div></div>

ID: 088777da

An event planner is planning a party. It costs the event planner a onetime fee of **\$35** to rent the venue and **\$10.25** per attendee. The event planner has a budget of **\$200**. What is the greatest number of attendees possible without exceeding the budget?

ID: 088777da Answer

Correct Answer: 16

Rationale

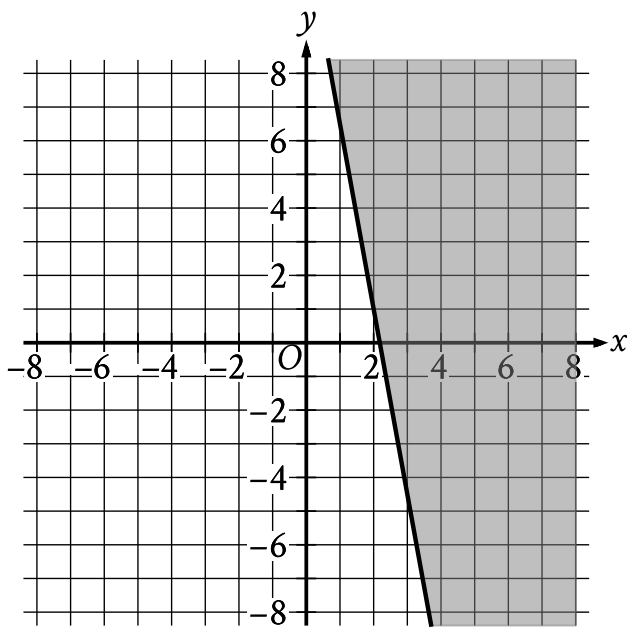
The correct answer is 16. The total cost of the party is found by adding the onetime fee of the venue to the cost per attendee times the number of attendees. Let x be the number of attendees. The expression $35 + 10.25x$ thus represents the total cost of the party. It's given that the budget is \$ 200, so this situation can be represented by the inequality $35 + 10.25x \leq 200$. The greatest number of attendees can be found by solving this inequality for x . Subtracting 35 from both sides of this inequality gives $10.25x \leq 165$. Dividing both sides of this inequality by 10.25 results in approximately $x \leq 16.098$. Since the question is stated in terms of attendees, rounding x down to the nearest whole number, 16, gives the greatest number of attendees possible.

Question Difficulty: Medium

Question ID e7976caa

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Algebra	Linear inequalities in one or two variables	<div><div></div><div></div><div></div></div>

ID: e7976caa



The shaded region shown represents solutions to an inequality. Which ordered pair (x, y) is a solution to this inequality?

- A. $(0, -4)$
- B. $(0, 4)$
- C. $(-4, 0)$
- D. $(4, 0)$

ID: e7976caa Answer

Correct Answer: D

Rationale

Choice D is correct. Since the shaded region shown represents solutions to an inequality, an ordered pair x, y is a solution to the inequality if it's represented by a point in the shaded region. Of the given choices, only $4, 0$ is represented by a point in the shaded region. Therefore, $4, 0$ is a solution to the inequality.

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.

