

Question ID 9868b7fc

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: 9868b7fc

A model estimates that whales from the genus *Eschrichtius* travel **72** to **77** miles in the ocean each day during their migration. Based on this model, which inequality represents the estimated total number of miles, x , a whale from the genus *Eschrichtius* could travel in **16** days of its migration?

- A. $72 + 16 \leq x \leq 77 + 16$
- B. $(72)(16) \leq x \leq (77)(16)$
- C. $72 \leq 16 + x \leq 77$
- D. $72 \leq 16x \leq 77$

ID: 9868b7fc Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that the model estimates that whales from the genus *Eschrichtius* travel 72 to 77 miles in the ocean each day during their migration. If one of these whales travels 72 miles each day for 16 days, then the whale travels 7216 miles total. If one of these whales travels 77 miles each day for 16 days, then the whale travels 7716 miles total. Therefore, the model estimates that in 16 days of its migration, a whale from the genus *Eschrichtius* could travel at least 7216 and at most 7716 miles total. Thus, the inequality $7216 \leq x \leq 7716$ represents the estimated total number of miles, x , a whale from the genus *Eschrichtius* could travel in 16 days of its migration.

Choice A is incorrect and may result from conceptual errors.

Choice C is incorrect and may result from conceptual errors.

Choice D is incorrect and may result from conceptual errors.

Question Difficulty: Hard

Question ID 7c24f272

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: 7c24f272

A business owner plans to purchase the same model of chair for each of the **81** employees. The total budget to spend on these chairs is **\$14,000**, which includes a **7%** sales tax. Which of the following is closest to the maximum possible price per chair, before sales tax, the business owner could pay based on this budget?

- A. **\$148.15**
- B. **\$161.53**
- C. **\$172.84**
- D. **\$184.94**

ID: 7c24f272 Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that a business owner plans to purchase 81 chairs. If p is the price per chair, the total price of purchasing 81 chairs is $81p$. It's also given that 7% sales tax is included, which is equivalent to $81p$ multiplied by 1.07, or $81(1.07)p$. Since the total budget is \$ 14,000, the inequality representing the situation is given by $81(1.07)p \leq 14,000$. Dividing both sides of this inequality by $81(1.07)$ and rounding the result to two decimal places gives $p \leq 161.53$. To not exceed the budget, the maximum possible price per chair is \$ 161.53.

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

Choice C is incorrect. This is the maximum possible price per chair including sales tax, not the maximum possible price per chair before sales tax.

Choice D is incorrect. This is the maximum possible price if the sales tax is added to the total budget, not the maximum possible price per chair before sales tax.

Question Difficulty: Hard

Question ID 35f40980

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: 35f40980

A small business owner budgets **\$2,200** to purchase candles. The owner must purchase a minimum of **200** candles to maintain the discounted pricing. If the owner pays **\$4.90** per candle to purchase small candles and **\$11.60** per candle to purchase large candles, what is the maximum number of large candles the owner can purchase to stay within the budget and maintain the discounted pricing?

ID: 35f40980 Answer

Correct Answer: 182

Rationale

The correct answer is 182. Let s represent the number of small candles the owner can purchase, and let l represent the number of large candles the owner can purchase. It's given that the owner pays \$ 4.90 per candle to purchase small candles and \$ 11.60 per candle to purchase large candles. Therefore, the owner pays $4.90s$ dollars for s small candles and $11.60l$ dollars for l large candles, which means the owner pays a total of $4.90s + 11.60l$ dollars to purchase candles. It's given that the owner budgets \$ 2,200 to purchase candles. Therefore, $4.90s + 11.60l \leq 2,200$. It's also given that the owner must purchase a minimum of 200 candles. Therefore, $s + l \geq 200$. The inequalities $4.90s + 11.60l \leq 2,200$ and $s + l \geq 200$ can be combined into one compound inequality by rewriting the second inequality so that its left-hand side is equivalent to the left-hand side of the first inequality. Subtracting l from both sides of the inequality $s + l \geq 200$ yields $s \geq 200 - l$. Multiplying both sides of this inequality by 4.90 yields $4.90s \geq 4.90(200 - l)$, or $4.90s \geq 980 - 4.90l$. Adding $11.60l$ to both sides of this inequality yields $4.90s + 11.60l \geq 980 - 4.90l + 11.60l$, or $4.90s + 11.60l \geq 980 + 6.70l$. This inequality can be combined with the inequality $4.90s + 11.60l \leq 2,200$, which yields the compound inequality $980 + 6.70l \leq 4.90s + 11.60l \leq 2,200$. It follows that $980 + 6.70l \leq 2,200$. Subtracting 980 from both sides of this inequality yields $6.70l \leq 2,200$. Dividing both sides of this inequality by 6.70 yields approximately $l \leq 182.09$. Since the number of large candles the owner purchases must be a whole number, the maximum number of large candles the owner can purchase is the largest whole number less than 182.09, which is 182.

Question Difficulty: Hard

Question ID 5ca4fe7f

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: 5ca4fe7f

$y > 13x - 18$

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

A.

<i>x</i>	<i>y</i>
3	21
5	47
8	86

B.

<i>x</i>	<i>y</i>
3	26
5	42
8	86

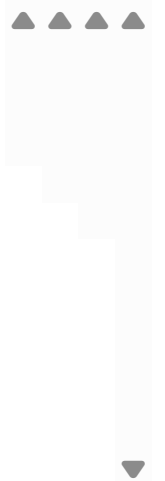
C.

<i>x</i>	<i>y</i>
3	16
5	42
8	81

D.

<i>x</i>	<i>y</i>
3	26
5	52

8	91



ID: 5ca4fe7f Answer

Correct Answer: D

Rationale

Choice D is correct. All the tables in the choices have the same three values of x , so each of the three values of x can be substituted in the given inequality to compare the corresponding values of y in each of the tables. Substituting 3 for x in the given inequality yields $y > 133 - 18$, or $y > 21$. Therefore, when $x = 3$, the corresponding value of y is greater than 21. Substituting 5 for x in the given inequality yields $y > 135 - 18$, or $y > 47$. Therefore, when $x = 5$, the corresponding value of y is greater than 47. Substituting 8 for x in the given inequality yields $y > 138 - 18$, or $y > 86$. Therefore, when $x = 8$, the corresponding value of y is greater than 86. For the table in choice D, when $x = 3$, the corresponding value of y is 26, which is greater than 21; when $x = 5$, the corresponding value of y is 52, which is greater than 47; when $x = 8$, the corresponding value of y is 91, which is greater than 86. Therefore, the table in choice D gives values of x and their corresponding values of y that are all solutions to the given inequality.

Choice A is incorrect. In the table for choice A, when $x = 3$, the corresponding value of y is 21, which is not greater than 21; when $x = 5$, the corresponding value of y is 47, which is not greater than 47; when $x = 8$, the corresponding value of y is 86, which is not greater than 86.

Choice B is incorrect. In the table for choice B, when $x = 5$, the corresponding value of y is 42, which is not greater than 47; when $x = 8$, the corresponding value of y is 86, which is not greater than 86.

Choice C is incorrect. In the table for choice C, when $x = 3$, the corresponding value of y is 16, which is not greater than 21; when $x = 5$, the corresponding value of y is 42, which is not greater than 47; when $x = 8$, the corresponding value of y is 81, which is not greater than 86.

Question Difficulty: Hard

Question ID 729bbc01

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: 729bbc01

$$\begin{aligned} y &> 14 \\ 4x + y &< 18 \end{aligned}$$

The point $(x, 53)$ is a solution to the system of inequalities in the xy -plane. Which of the following could be the value of x ?

- A. -9
- B. -5
- C. 5
- D. 9

ID: 729bbc01 Answer

Correct Answer: A

Rationale

Choice A is correct. It’s given that the point $x, 53$ is a solution to the given system of inequalities in the xy -plane. This means that the coordinates of the point, when substituted for the variables x and y , make both of the inequalities in the system true. Substituting 53 for y in the inequality $y > 14$ yields $53 > 14$, which is true. Substituting 53 for y in the inequality $4x + y < 18$ yields $4x + 53 < 18$. Subtracting 53 from both sides of this inequality yields $4x < -35$. Dividing both sides of this inequality by 4 yields $x < -8.75$. Therefore, x must be a value less than -8.75 . Of the given choices, only -9 is less than -8.75 .

Choice B is incorrect. Substituting -5 for x and 53 for y in the inequality $4x + y < 18$ yields $4(-5) + 53 < 18$, or $33 < 18$, which is not true.

Choice C is incorrect. Substituting 5 for x and 53 for y in the inequality $4x + y < 18$ yields $4(5) + 53 < 18$, or $73 < 18$, which is not true.

Choice D is incorrect. Substituting 9 for x and 53 for y in the inequality $4x + y < 18$ yields $4(9) + 53 < 18$, or $89 < 18$, which is not true.

Question Difficulty: Hard

Question ID 309f1dc6

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: 309f1dc6

$$\begin{aligned}y &\leq x + 7 \\ y &\geq -2x - 1\end{aligned}$$

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

- A. $(-14, 0)$
- B. $(0, -14)$
- C. $(0, 14)$
- D. $(14, 0)$

ID: 309f1dc6 Answer

Correct Answer: D

Rationale

Choice D is correct. A point x, y is a solution to a system of inequalities in the xy -plane if substituting the x -coordinate and the y -coordinate of the point for x and y , respectively, in each inequality makes both of the inequalities true. Substituting the x -coordinate and the y -coordinate of choice D, 14 and 0, for x and y , respectively, in the first inequality in the given system, $y \leq x + 7$, yields $0 \leq 14 + 7$, or $0 \leq 21$, which is true. Substituting 14 for x and 0 for y in the second inequality in the given system, $y \geq -2x - 1$, yields $0 \geq -2(14) - 1$, or $0 \geq -29$, which is true. Therefore, the point 14, 0 is a solution to the given system of inequalities in the xy -plane.

Choice A is incorrect. Substituting -14 for x and 0 for y in the inequality $y \leq x + 7$ yields $0 \leq -14 + 7$, or $0 \leq -7$, which is not true.

Choice B is incorrect. Substituting 0 for x and -14 for y in the inequality $y \geq -2x - 1$ yields $-14 \geq -2(0) - 1$, or $-14 \geq -1$, which is not true.

Choice C is incorrect. Substituting 0 for x and 14 for y in the inequality $y \leq x + 7$ yields $14 \leq 0 + 7$, or $14 \leq 7$, which is not true.

Question Difficulty: Hard

Question ID 59e1fbbe

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: 59e1fbbe

A number x is at most **2** less than **3** times the value of y . If the value of y is **~~4~~**, what is the greatest possible value of x ?

ID: 59e1fbbe Answer

Correct Answer: -14

Rationale

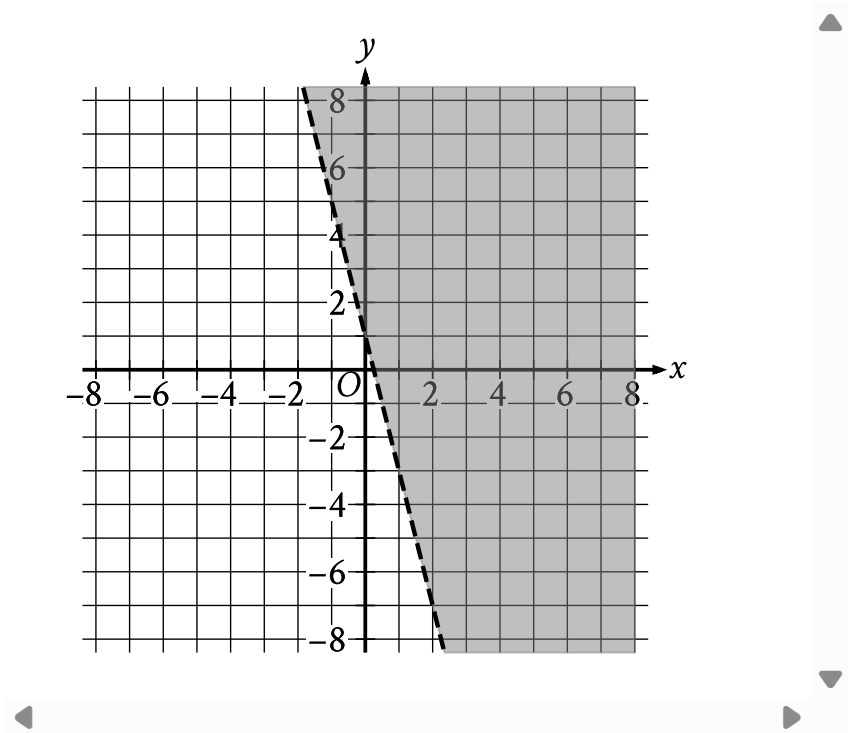
The correct answer is -14. It's given that a number x is at most 2 less than 3 times the value of y . Therefore, x is less than or equal to 2 less than 3 times the value of y . The expression $3y$ represents 3 times the value of y . The expression $3y - 2$ represents 2 less than 3 times the value of y . Therefore, x is less than or equal to $3y - 2$. This can be shown by the inequality $x \leq 3y - 2$. Substituting -4 for y in this inequality yields $x \leq 3(-4) - 2$ or, $x \leq -14$. Therefore, if the value of y is -4, the greatest possible value of x is -14.

Question Difficulty: Hard

Question ID 7ce498a1

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: 7ce498a1



The shaded region shown represents the solutions to which inequality?

- A. $y < 1 + 4x$
- B. $y < 1 - 4x$
- C. $y > 1 + 4x$
- D. $y > 1 - 4x$

ID: 7ce498a1 Answer

Correct Answer: D

Rationale

Choice D is correct. The equation for the line representing the boundary of the shaded region can be written in slope-intercept form $y = b + mx$, 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, 1 and 1, - 3. 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, 1 and 1, - 3 for x_1, y_1 and x_2, y_2 in this equation yields $m = \frac{-3 - 1}{1 - 0}$, which is equivalent to $m = \frac{-4}{1}$, or $m = - 4$. Since the point 0, 1 represents the y-intercept, it follows that $b = 1$. Substituting -4 for m and 1 for b in the equation $y = b + mx$ yields $y = 1 - 4x$ as the equation of the boundary line. Since the shaded region represents all the points above this boundary line, it follows that the shaded region shown represents the solutions to the inequality $y > 1 - 4x$.

Choice A is incorrect. This inequality represents a region below, not above, a boundary line with a slope of 4, not -4.

Choice B is incorrect. This inequality represents a region below, not above, the boundary line shown.

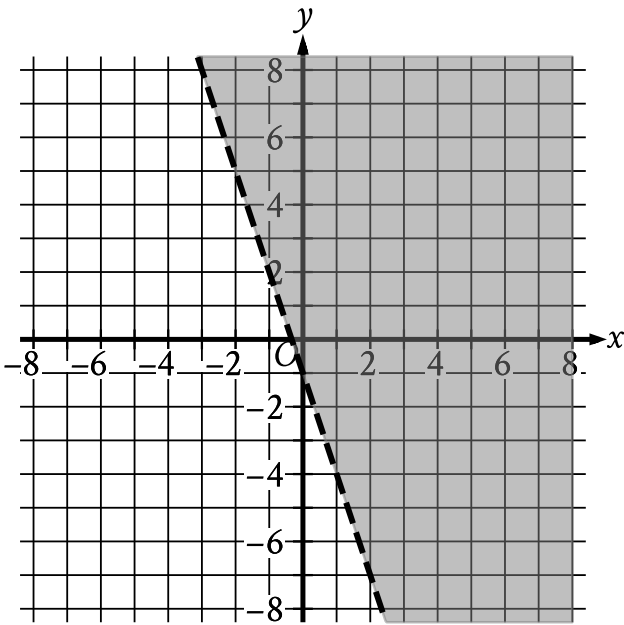
Choice C is incorrect. This inequality represents a region whose boundary line has a slope of 4, not -4.

Question Difficulty: Hard

Question ID 09834b8b

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: 09834b8b



The shaded region shown represents the solutions to which inequality?

- A. $y < -1 + 3x$
- B. $y < -1 - 3x$
- C. $y > -1 + 3x$
- D. $y > -1 - 3x$

ID: 09834b8b Answer

Correct Answer: D

Rationale

Choice D is correct. The equation for the line representing the boundary of the shaded region can be written in slope-intercept form $y = b + mx$, 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 $(0, -1)$ and $(1, -4)$. 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 $(0, -1)$ and $(1, -4)$ for (x_1, y_1) and (x_2, y_2) in this equation yields $m = \frac{-4 - (-1)}{1 - 0}$, which is equivalent to $m = \frac{-3}{1}$, or $m = -3$. Since the point $(0, -1)$ represents the y -intercept, it follows that $b = -1$. Substituting -3 for m and -1 for b in the equation $y = b + mx$ yields $y = -1 - 3x$ as the equation of the boundary line. Since the shaded region represents all the points above this boundary line, it follows that the shaded region shown represents the solutions to the inequality $y > -1 - 3x$.

Choice A is incorrect. This inequality represents a region below, not above, a boundary line with a slope of 3, not -3.

Choice B is incorrect. This inequality represents a region below, not above, the boundary line shown.

Choice C is incorrect. This inequality represents a region whose boundary line has a slope of 3, not -3.

Question Difficulty: Hard

Question ID 30135558

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: 30135558

$y < 6x + 2$

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
3	20
5	32
7	44

B.

x	y
3	16
5	36
7	40

C.

x	y
3	16
5	28
7	40

D.

x	y
3	24
5	36
7	48

ID: 30135558 Answer

Correct Answer: C

Rationale

Choice C is correct. All the tables in the choices have the same three values of x , so each of the three values of x can be substituted in the given inequality to compare the corresponding values of y in each of the tables. Substituting 3 for x in the given inequality yields $y < 63 + 2$, or $y < 20$. Therefore, when $x = 3$, the corresponding value of y is less than 20. Substituting 5 for x in the given inequality yields $y < 65 + 2$, or $y < 32$. Therefore, when $x = 5$, the corresponding value of y is less than 32. Substituting 7 for x in the given inequality yields $y < 67 + 2$, or $y < 44$. Therefore, when $x = 7$, the corresponding value of y is less than 44. For the table in choice C, when $x = 3$, the corresponding value of y is 16, which is less than 20; when $x = 5$, the corresponding value of y is 28, which is less than 32; when $x = 7$, the corresponding value of y is 40, which is less than 44. Therefore, the table in choice C gives values of x and their corresponding values of y that are all solutions to the given inequality.

Choice A is incorrect. In the table for choice A, when $x = 3$, the corresponding value of y is 20, which is not less than 20; when $x = 5$, the corresponding value of y is 32, which is not less than 32; when $x = 7$, the corresponding value of y is 44, which is not less than 44.

Choice B is incorrect. In the table for choice B, when $x = 5$, the corresponding value of y is 36, which is not less than 32.

Choice D is incorrect. In the table for choice D, when $x = 3$, the corresponding value of y is 24, which is not less than 20; when $x = 5$, the corresponding value of y is 36, which is not less than 32; when $x = 7$, the corresponding value of y is 48, which is not less than 44.

Question Difficulty: Hard

Question ID 30135558

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: 30135558

$y < 6x + 2$

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
3	20
5	32
7	44

B.

x	y
3	16
5	36
7	40

C.

x	y
3	16
5	28
7	40

D.

x	y
3	24
5	36
7	48

ID: 30135558 Answer

Correct Answer: C

Rationale

Choice C is correct. All the tables in the choices have the same three values of x , so each of the three values of x can be substituted in the given inequality to compare the corresponding values of y in each of the tables. Substituting 3 for x in the given inequality yields $y < 63 + 2$, or $y < 20$. Therefore, when $x = 3$, the corresponding value of y is less than 20. Substituting 5 for x in the given inequality yields $y < 65 + 2$, or $y < 32$. Therefore, when $x = 5$, the corresponding value of y is less than 32. Substituting 7 for x in the given inequality yields $y < 67 + 2$, or $y < 44$. Therefore, when $x = 7$, the corresponding value of y is less than 44. For the table in choice C, when $x = 3$, the corresponding value of y is 16, which is less than 20; when $x = 5$, the corresponding value of y is 28, which is less than 32; when $x = 7$, the corresponding value of y is 40, which is less than 44. Therefore, the table in choice C gives values of x and their corresponding values of y that are all solutions to the given inequality.

Choice A is incorrect. In the table for choice A, when $x = 3$, the corresponding value of y is 20, which is not less than 20; when $x = 5$, the corresponding value of y is 32, which is not less than 32; when $x = 7$, the corresponding value of y is 44, which is not less than 44.

Choice B is incorrect. In the table for choice B, when $x = 5$, the corresponding value of y is 36, which is not less than 32.

Choice D is incorrect. In the table for choice D, when $x = 3$, the corresponding value of y is 24, which is not less than 20; when $x = 5$, the corresponding value of y is 36, which is not less than 32; when $x = 7$, the corresponding value of y is 48, which is not less than 44.

Question Difficulty: Hard

Question ID 09dd5dc0

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: 09dd5dc0

The triangle inequality theorem states that the sum of any two sides of a triangle must be greater than the length of the third side. If a triangle has side lengths of **6** and **12**, which inequality represents the possible lengths, x , of the third side of the triangle?

- A. $x < 18$
- B. $x > 18$
- C. $6 < x < 18$
- D. $x < 6$ or $x > 18$

ID: 09dd5dc0 Answer

Correct Answer: C

Rationale

Choice C is correct. It's given that a triangle has side lengths of 6 and 12, and x represents the length of the third side of the triangle. It's also given that the triangle inequality theorem states that the sum of any two sides of a triangle must be greater than the length of the third side. Therefore, the inequalities $6 + x > 12$, $6 + 12 > x$, and $12 + x > 6$ represent all possible values of x . Subtracting 6 from both sides of the inequality $6 + x > 12$ yields $x > 12 - 6$, or $x > 6$. Adding 6 and 12 in the inequality $6 + 12 > x$ yields $18 > x$, or $x < 18$. Subtracting 12 from both sides of the inequality $12 + x > 6$ yields $x > 6 - 12$, or $x > -6$. Since all x -values that satisfy the inequality $x > 6$ also satisfy the inequality $x > -6$, it follows that the inequalities $x > 6$ and $x < 18$ represent the possible values of x . Therefore, the inequality $6 < x < 18$ represents the possible lengths, x , of the third side of the triangle.

Choice A is incorrect. This inequality gives the upper bound for x but does not include its lower bound.

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: Hard

Question ID 365b9585

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: 365b9585

The minimum value of x is **12** less than **6** times another number n . Which inequality shows the possible values of x ?

- A. $x \leq 6n - 12$
- B. $x \geq 6n - 12$
- C. $x \leq 12 - 6n$
- D. $x \geq 12 - 6n$

ID: 365b9585 Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that the minimum value of x is 12 less than 6 times another number n . Therefore, the possible values of x are all greater than or equal to the value of 12 less than 6 times n . The value of 6 times n is given by the expression $6n$. The value of 12 less than $6n$ is given by the expression $6n - 12$. Therefore, the possible values of x are all greater than or equal to $6n - 12$. This can be shown by the inequality $x \geq 6n - 12$.

Choice A is incorrect. This inequality shows the possible values of x if the maximum, not the minimum, value of x is 12 less than 6 times n .

Choice C is incorrect. This inequality shows the possible values of x if the maximum, not the minimum, value of x is 6 times n less than 12, not 12 less than 6 times n .

Choice D is incorrect. This inequality shows the possible values of x if the minimum value of x is 6 times n less than 12, not 12 less than 6 times n .

Question Difficulty: Hard

Question ID 69a5295b

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: 69a5295b

$2x - y > 883$

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
440	0
441	-2
442	-4

B.

x	y
440	0
442	-2
441	-4

C.

x	y
442	0
440	-2
441	-4

D.

x	y
442	0
441	-2
440	-4

ID: 69a5295b Answer

Correct Answer: D

Rationale

Choice D is correct. All the tables in the choices have the same three values of x , 440, 441, and 442, so each of the three values of x can be substituted in the given inequality to compare the corresponding values of y in each of the tables. Substituting 440 for x in the given inequality yields $2440 - y > 883$, or $880 - y > 883$. Subtracting 880 from both sides of this inequality yields $-y > 3$. Dividing both sides of this inequality by -1 yields $y < -3$. Therefore, when $x = 440$, the corresponding value of y must be less than -3 . Substituting 441 for x in the given inequality yields $2441 - y > 883$, or $882 - y > 883$. Subtracting 882 from both sides of this inequality yields $-y > 1$. Dividing both sides of this inequality by -1 yields $y < -1$. Therefore, when $x = 441$, the corresponding value of y must be less than -1 . Substituting 442 for x in the given inequality yields $2442 - y > 883$, or $884 - y > 883$. Subtracting 884 from both sides of this inequality yields $-y > -1$. Dividing both sides of this inequality by -1 yields $y < 1$. Therefore, when $x = 442$, the corresponding value of y must be less than 1. For the table in choice D, when $x = 440$, the corresponding value of y is -4 , which is less than -3 ; when $x = 441$, the corresponding value of y is -2 , which is less than -1 ; when $x = 442$, the corresponding value of y is 0, which is less than 1. Therefore, the table in choice D gives values of x and their corresponding values of y that are all solutions to the given inequality.

Choice A is incorrect. When $x = 440$, the corresponding value of y in this table is 0, which isn't less than -3 .

Choice B is incorrect. When $x = 440$, the corresponding value of y in this table is 0, which isn't less than -3 .

Choice C is incorrect. When $x = 440$, the corresponding value of y in this table is -2 , which isn't less than -3 .

Question Difficulty: Hard

Question ID a06c0a64

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: a06c0a64

A number x is at most 17 less than 5 times the value of y . If the value of y is 3, what is the greatest possible value of x ?

ID: a06c0a64 Answer

Correct Answer: -2

Rationale

The correct answer is -2. It's given that a number x is at most 17 less than 5 times the value of y , or $x \leq 5y - 17$. Substituting 3 for y in this inequality yields $x \leq 5(3) - 17$, or $x \leq -2$. Thus, if the value of y is 3, the greatest possible value of x is -2.

Question Difficulty: Hard

Question ID a8c33268

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: a8c33268

A salesperson’s total earnings consist of a base salary of x dollars per year, plus commission earnings of **11%** of the total sales the salesperson makes during the year. This year, the salesperson has a goal for the total earnings to be at least **3** times and at most **4** times the base salary. Which of the following inequalities represents all possible values of total sales s , in dollars, the salesperson can make this year in order to meet that goal?

- A. $2x \leq s \leq 3x$
- B. $\frac{2}{0.11}x \leq s \leq \frac{3}{0.11}x$
- C. $3x \leq s \leq 4x$
- D. $\frac{3}{0.11}x \leq s \leq \frac{4}{0.11}x$

ID: a8c33268 Answer

Correct Answer: B

Rationale

Choice B is correct. It’s given that a salesperson’s total earnings consist of a base salary of x dollars per year plus commission earnings of 11% of the total sales the salesperson makes during the year. If the salesperson makes s dollars in total sales this year, the salesperson’s total earnings can be represented by the expression $x + 0.11s$. It’s also given that the salesperson has a goal for the total earnings to be at least 3 times and at most 4 times the base salary, which can be represented by the expressions $3x$ and $4x$, respectively. Therefore, this situation can be represented by the inequality $3x \leq x + 0.11s \leq 4x$. Subtracting x from each part of this inequality yields $2x \leq 0.11s \leq 3x$. Dividing each part of this inequality by 0.11 yields $\frac{2}{0.11}x \leq s \leq \frac{3}{0.11}x$. Therefore, the inequality $\frac{2}{0.11}x \leq s \leq \frac{3}{0.11}x$ represents all possible values of total sales s , in dollars, the salesperson can make this year in order to meet their goal.

Choice A is incorrect. This inequality represents a situation in which the total sales, rather than the total earnings, are at least 2 times and at most 3 times, rather than at least 3 times and at most 4 times, the base salary.

Choice C is incorrect. This inequality represents a situation in which the total sales, rather than the total earnings, are at least 3 times and at most 4 times the base salary.

Choice D is incorrect. This inequality represents a situation in which the total earnings are at least 4 times and at most 5 times, rather than at least 3 times and at most 4 times, the base salary.

Question Difficulty: Hard

Question ID e81b7277

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: e81b7277

$y < 5x + 6$

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

A.

<i>x</i>	<i>y</i>
3	17
5	27
7	37

B.

<i>x</i>	<i>y</i>
3	17
5	35
7	37

C.

<i>x</i>	<i>y</i>
3	25
5	35
7	45

D.

<i>x</i>	<i>y</i>
3	21
5	31
7	41

ID: e81b7277 Answer

Correct Answer: A

Rationale

Choice A is correct. Substituting 3 for x in the given inequality yields $y < 53 + 6$, or $y < 21$. Therefore, when $x = 3$, the corresponding value of y is less than 21. Substituting 5 for x in the given inequality yields $y < 55 + 6$, or $y < 31$. Therefore, when $x = 5$, the corresponding value of y is less than 31. Substituting 7 for x in the given inequality yields $y < 57 + 6$, or $y < 41$. Therefore, when $x = 7$, the corresponding value of y is less than 41. For the table in choice A, when $x = 3$, the corresponding value of y is 17, which is less than 21; when $x = 5$, the corresponding value of y is 27, which is less than 31; and when $x = 7$, the corresponding value of y is 37, which is less than 41. Therefore, the table in choice A gives values of x and their corresponding values of y that are all solutions to the given inequality.

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: Hard

Question ID 3f6c5272

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: 3f6c5272

A truck can haul a maximum weight of **5,630** pounds. During one trip, the truck will be used to haul a **190**-pound piece of equipment as well as several crates. Some of these crates weigh **25** pounds each and the others weigh **62** pounds each. Which inequality represents the possible combinations of the number of **25**-pound crates, x , and the number of **62**-pound crates, y , the truck can haul during one trip if only the piece of equipment and the crates are being hauled?

- A. $25x + 62y \leq 5,440$
- B. $25x + 62y \geq 5,440$
- C. $62x + 25y \leq 5,630$
- D. $62x + 25y \geq 5,630$

ID: 3f6c5272 Answer

Correct Answer: A

Rationale

Choice A is correct. It's given that a truck can haul a maximum of 5,630 pounds. It's also given that during one trip, the truck will be used to haul a 190-pound piece of equipment as well as several crates. It follows that the truck can haul at most 5,630 - 190, or 5,440, pounds of crates. Since x represents the number of 25-pound crates, the expression $25x$ represents the weight of the 25-pound crates. Since y represents the number of 62-pound crates, $62y$ represents the weight of the 62-pound crates. Therefore, $25x + 62y$ represents the total weight of the crates the truck can haul. Since the truck can haul at most 5,440 pounds of crates, the total weight of the crates must be less than or equal to 5,440 pounds, or $25x + 62y \leq 5,440$.

Choice B is incorrect. This represents the possible combinations of the number of 25-pound crates, x , and the number of 62-pound crates, y , the truck can haul during one trip if it can haul a minimum, not a maximum, of 5,630 pounds.

Choice C is incorrect. This represents the possible combinations of the number of 62-pound crates, x , and the number of 25-pound crates, y , the truck can haul during one trip if only crates are being hauled.

Choice D is incorrect. This represents the possible combinations of the number of 62-pound crates, x , and the number of 25-pound crates, y , the truck can haul during one trip if it can haul a minimum, not a maximum, weight of 5,630 pounds and only crates are being hauled.

Question Difficulty: Hard