Question ID a26fed41

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear inequalities in one or two variables	Easy

ID: a26fed41

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: a26fed41 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: Easy

Question ID 6dc8c2cd

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear inequalities in one or two variables	Easy

ID: 6dc8c2cd

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: 6dc8c2cd Answer

Correct Answer: 5

Rationale

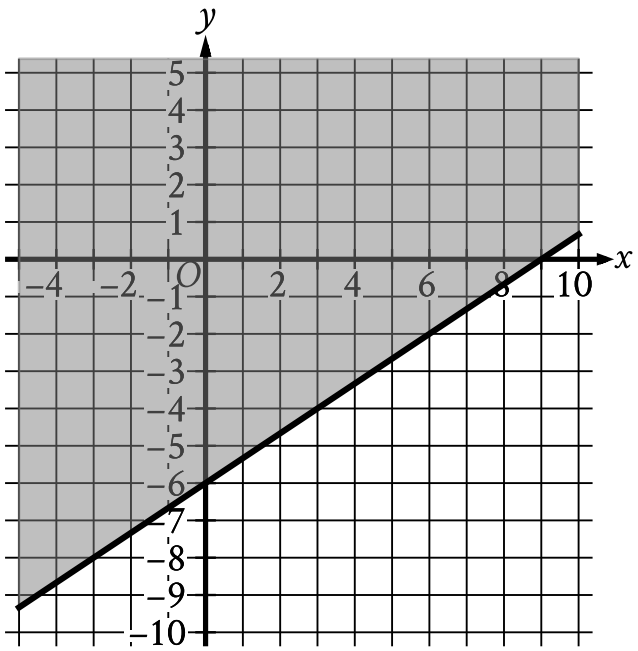
The correct answer is 5. Let p represent the number of packages of dinner rolls that should be bought for the party. It's given that dinner rolls are sold in packages of 12. Therefore, $12p$ represents the number of dinner rolls that should be bought for the party. It's also given that 50 dinner rolls 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: Easy

Question ID 741da959

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear inequalities in one or two variables	Easy

ID: 741da959



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: 741da959 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 $0, b$ 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: Easy

Question ID d6a4f60f

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear inequalities in one or two variables	Easy

ID: d6a4f60f

During spring migration, a dragonfly traveled a minimum of $1{,}510$ miles and a maximum of $4{,}130$ miles between stopover locations. Which inequality represents this situation, where d is a possible distance, in miles, this dragonfly traveled between stopover locations during spring migration?

A. $d \leq 1{,}510$

B. $1{,}510 \leq d \leq 4{,}130$

C. $d \geq 4{,}130$

D. $4{,}130 \leq d \leq 5{,}640$

ID: d6a4f60f Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that during spring migration, a dragonfly traveled a minimum of $1{,}510$ miles and a maximum of $4{,}130$ miles between stopover locations. It's also given that d represents a possible distance, in miles, this dragonfly traveled between stopover locations. It follows that the inequality $1{,}510 \leq d \leq 4{,}130$ represents this situation.

Choice A is incorrect. This inequality represents a situation in which a dragonfly traveled a maximum of $1{,}510$ miles between stopover locations.

Choice C is incorrect. This inequality represents a situation in which a dragonfly traveled a minimum of $4{,}130$ miles between stopover locations.

Choice D is incorrect. This inequality represents a situation in which a dragonfly traveled a minimum of $4{,}310$ miles and a maximum of $5{,}640$ miles between stopover locations.

Question Difficulty: Easy

Question ID f1a5302a

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear inequalities in one or two variables	Easy

ID: f1a5302a

A geologist estimates that the volume of a slab of granite is greater than 12.7 cubic feet but less than 15.7 cubic feet. The geologist also estimates that the slab of granite weighs 165 pounds per cubic foot of volume. Which inequality represents this situation, where x represents the estimated total weight, in pounds, of the slab of granite?

A. $165 - 15.7 < x < 165 - 12.7$

B. $165 + 12.7 < x < 165 + 15.7$

C. $165(12.7) < x < 165(15.7)$

D. $\frac{165}{15.7} < x < \frac{165}{12.7}$

ID: f1a5302a Answer

Correct Answer: C

Rationale

Choice C is correct. It's given that the estimated volume of the slab of granite is greater than 12.7 cubic feet but less than 15.7 cubic feet. It's also given that the estimated weight per cubic foot of volume of that slab is 165 pounds. The estimated total weight of the slab of granite, in pounds, can be calculated by multiplying the estimated volume by the estimated weight per cubic foot. Therefore, if the estimated volume of the slab of granite is 12.7 cubic feet, its estimated total weight is $165\left(12.7\right)$ pounds, and if the estimated volume of the slab of granite is 15.7 cubic feet, its estimated total weight is $165\left(15.7\right)$ pounds. Since the estimated volume of the slab of granite is greater than 12.7 cubic feet but less than 15.7 cubic feet, the estimated total weight x, in pounds, must be greater than $165\left(12.7\right)$ pounds and less than $165\left(15.7\right)$ pounds. This situation can be represented by the inequality $165\left(12.7\right) < x < 165\left(15.7\right)$.

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: Easy

Question ID ae4f73e4

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear inequalities in one or two variables	Easy

ID: ae4f73e4

During a portion of a flight, a small airplane's cruising speed varied between 150 miles per hour and 170 miles per hour. Which inequality best represents this situation, where s is the cruising speed, in miles per hour, during this portion of the flight?

A. $s \leq 20$

B. $s \leq 150$

C. $s \leq 170$

D. $150 \leq s \leq 170$

ID: ae4f73e4 Answer

Correct Answer: D

Rationale

Choice D is correct. It's given that during a portion of a flight, a small airplane's cruising speed varied between 150 miles per hour and 170 miles per hour. It's also given that s represents the cruising speed, in miles per hour, during this portion of the flight. It follows that the airplane's cruising speed, in miles per hour, was at least 150, which means $s \geq 150$, and was at most 170, which means $s \leq 170$. Therefore, the inequality that best represents this situation is $150 \leq s \leq 170$.

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: Easy

Question ID c5380c0c

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear inequalities in one or two variables	Easy

ID: c5380c0c

The total cost, in dollars, to rent a surfboard consists of a $\$25$ service fee and a $\$10$ per hour rental fee. A person rents a surfboard for t hours and intends to spend a maximum of $\$75$ to rent the surfboard. Which inequality represents this situation?

A. $10t \leq 75$

B. $10 + 25t \leq 75$

C. $25t \leq 75$

D. $25 + 10t \leq 75$

ID: c5380c0c Answer

Correct Answer: D

Rationale

Choice D is correct. The cost of the rental fee depends on the number of hours the surfboard is rented. Multiplying t hours by 10 dollars per hour yields a rental fee of $10t$ dollars. The total cost of the rental consists of the rental fee plus the 25 dollar service fee, which yields a total cost of $25 + 10t$ dollars. Since the person intends to spend a maximum of 75 dollars to rent the surfboard, the total cost must be at most 75 dollars. Therefore, the inequality $25 + 10t \leq 75$ represents this situation.

Choice A is incorrect. This represents a situation where the rental fee, not the total cost, is at most 75 dollars.

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: Easy

Question ID 831c2cb3

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear inequalities in one or two variables	Easy

ID: 831c2cb3

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: 831c2cb3 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: Easy

Question ID b7dbe5b2

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear inequalities in one or two variables	Easy

ID: b7dbe5b2

For a 3-week period in a town in Illinois, the lowest recorded temperature was 31 degrees Fahrenheit $(^\circ\mathrm{F})$ and the highest recorded temperature was $67^\circ\mathrm{F}$. Which inequality is true for any recorded temperature t, in $^\circ\mathrm{F}$, in this town for this 3-week period?

A. $t \geq 98$

B. $t \geq 67$

C. $31 \leq t \leq 67$

D. $t \leq 31$

ID: b7dbe5b2 Answer

Correct Answer: C

Rationale

Choice C is correct. It's given that for a 3-week period in a town in Illinois, the lowest recorded temperature was $31°\mathrm{F}$ and the highest recorded temperature was $67°\mathrm{F}$. It follows that the inequality $31 \leq t \leq 67$ is true for any recorded temperature t, in $°\mathrm{F}$, in this town for this 3-week period.

Choice A is incorrect and may result from conceptual errors.

Choice B is incorrect and may result from conceptual errors.

Choice D is incorrect and may result from conceptual errors.

Question Difficulty: Easy

Question ID bee774f4

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear inequalities in one or two variables	Easy

ID: bee774f4

Ty set a goal to walk at least 24 kilometers every day to prepare for a multiday hike. On a certain day, Ty plans to walk at an average speed of 4 kilometers per hour. What is the minimum number of hours Ty must walk on that day to fulfill the daily goal?

A. 4

B. 6

C. 20

D. 24

ID: bee774f4 Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that Ty plans to walk at an average speed of 4 kilometers per hour. The number of kilometers Ty will walk is determined by the expression $4s$, where s is the number of hours Ty walks. The given goal of at least 24 kilometers means that the inequality $4s \geq 24$ represents the situation. Dividing both sides of this inequality by 4 gives $s \geq 6$, which corresponds to a minimum of 6 hours Ty must walk.

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

Question ID 247a6ed7

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear inequalities in one or two variables	Easy

ID: 247a6ed7

Julissa needs at least 100 hours of flight time to get her private pilot certification. If Julissa already has 86 hours of flight time, what is the minimum number of additional hours of flight time Julissa needs to get her private pilot certification?

A. 14

B. 76

C. 86

D. 186

ID: 247a6ed7 Answer

Correct Answer: A

Rationale

Choice A is correct. It's given that Julissa already has 86 hours of flight time. Let x represent the number of additional hours of flight time Julissa needs to get her private pilot certification. After completing x hours of flight time, Julissa will have completed a total of $86 + x$ hours of flight time. It's given that Julissa needs at least 100 hours of flight time to get her private pilot certification. Therefore, $86 + x \geq 100$. Subtracting 86 from both sides of this inequality yields $x \geq 14$. Thus, 14 is the minimum number of additional hours of flight time Julissa needs to get her private pilot certification.

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

Choice C is incorrect. This is the number of hours of flight time Julissa already has, rather than the minimum number of additional hours of flight time Julissa needs.

Choice D is incorrect. This is the number of hours of flight time Julissa will have if she completes 100 more hours of flight time, rather than the minimum number of additional hours of flight time Julissa needs.

Question Difficulty: Easy

Question ID 0f93d317

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear inequalities in one or two variables	Easy

ID: 0f93d317

A geologist needs to collect at least 67 samples of lava from a volcano. If the geologist has already collected 63 samples from the volcano, what is the minimum number of additional samples the geologist needs to collect?

A. 130

B. 63

C. 4

D. 0

ID: 0f93d317 Answer

Correct Answer: C

Rationale

Choice C is correct. It's given that the geologist has already collected 63 samples from the volcano. Let x represent the number of additional samples the geologist needs to collect. After collecting x additional samples, the geologist will have collected a total of $63 + x$ samples. It's given that the geologist needs to collect at least 67 samples. Therefore, $63 + x \geq 67$. Subtracting 63 from each side of this inequality yields the inequality $x \geq 4$. Thus, the geologist needs to collect a minimum of 4 additional samples.

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

Choice B is incorrect. This is the number of samples the geologist has already collected, rather than the minimum number of additional samples the geologist needs to collect.

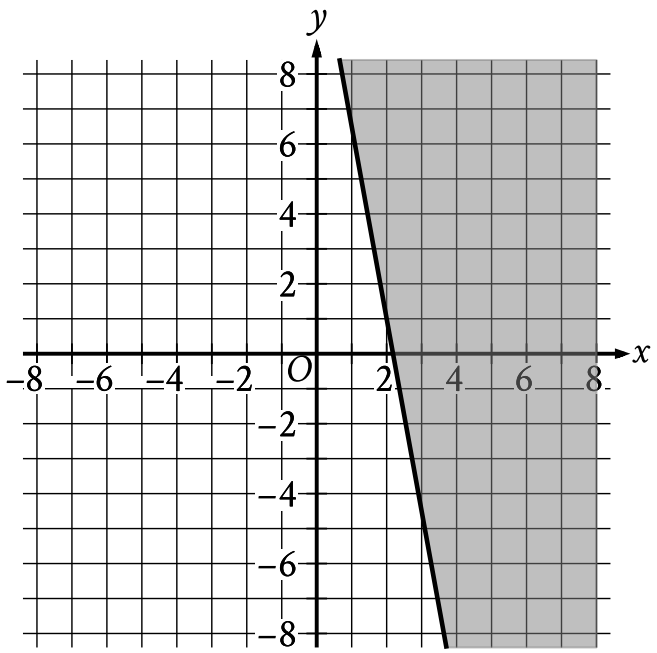
Choice D is incorrect. If the geologist collects 0 additional samples, the geologist will have collected a total of 63 samples, which is less than 67 samples.

Question Difficulty: Easy

Question ID 6ecc2ab0

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear inequalities in one or two variables	Easy

ID: 6ecc2ab0



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: 6ecc2ab0 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.

Question Difficulty: Easy

Question ID 1163d8e0

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear inequalities in one or two variables	Easy

ID: 1163d8e0

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: 1163d8e0 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: Easy

Question ID ad8d076e

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear inequalities in one or two variables	Easy

ID: ad8d076e

Monarch butterflies can fly only with a body temperature of at least 55.0 degrees Fahrenheit ($^\circ\mathrm{F}$). If a monarch butterfly's body temperature is $51.3^\circ\mathrm{F}$, what is the minimum increase needed in its body temperature, in $^\circ\mathrm{F}$, so that it can fly?

A. 1.3

B. 3.7

C. 5.0

D. 6.3

ID: ad8d076e Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that monarch butterflies can fly only with a body temperature of at least 55.0 degrees Fahrenheit °F. Let x represent the minimum increase needed in the monarch butterfly's body temperature to fly. If the monarch butterfly's body temperature is 51.3°F, the inequality $51.3 + x \geq 55.0$ represents this situation. Subtracting 51.3 from both sides of this inequality yields $x \geq 3.7$. Therefore, if the monarch butterfly's body temperature is 51.3°F, the minimum increase needed in its body temperature, in °F, so that it can fly is 3.7.

Choice A is incorrect. This is the minimum increase needed in body temperature if the monarch butterfly's body temperature is 53.7°F, not 51.3°F.

Choice C is incorrect. This is the minimum increase needed in body temperature if the monarch butterfly's body temperature is 50.0°F, not 51.3°F.

Choice D is incorrect. This is the minimum increase needed in body temperature if the monarch butterfly's body temperature is 48.7°F, not 51.3°F.

Question Difficulty: Easy

Question ID 30d645b0

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Algebra	Linear inequalities in one or two variables	Easy

ID: 30d645b0

$$2\ell + 2w \leq 27$$

A rectangle has length ℓ and width w. The inequality gives the possible values of ℓ and w for which the perimeter of this rectangle is less than or equal to 27. Which statement is the best interpretation of $(\ell, w) = (8, 3)$ in this context?

A. If the rectangle has length 3 and width 8, its perimeter is less than or equal to 27.

B. If the rectangle has length 8 and width 3, its perimeter is less than or equal to 27.

C. If the rectangle has length 3 and width 8, its perimeter is greater than or equal to 27.

D. If the rectangle has length 8 and width 3, its perimeter is greater than or equal to 27.

ID: 30d645b0 Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that a rectangle has length l and width w, and the inequality $2l + 2w \leq 27$ gives the possible values of l and w for which the perimeter of this rectangle is less than or equal to 27. To determine the best interpretation of $(l, w) = (8, 3)$ in this context, the values can be substituted in the given inequality. Substituting 8 for l and 3 for w in this inequality yields $2(8) + 2(3) \leq 27$, which is equivalent to $16 + 6 \leq 27$, or $22 \leq 27$. Since this inequality is true, if the rectangle has length 8 and width 3, its perimeter is less than or equal to 27.

Choice A is incorrect. The interpretation of $(l, w) = (8, 3)$ implies that the rectangle has length 8 and width 3, not length 3 and width 8.

Choice C is incorrect. The interpretation of $(l, w) = (8, 3)$ implies that the rectangle has length 8 and width 3, not length 3 and width 8.

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

Question Difficulty: Easy