

Question ID c20160de

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

ID: c20160de

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

- A. **1.3**
- B. **3.7**
- C. **5.0**
- D. **6.3**

ID: c20160de 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 2e4cdcad

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

ID: 2e4cdcad

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: 2e4cdcad 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 fc285932

Assessment	Test	Domain	Skill	Difficulty
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ID: fc285932

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: fc285932 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 337be703

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

ID: 337be703

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: 337be703 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 5cabd603

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

ID: 5cabd603

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: 5cabd603 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 0b52d235

Assessment	Test	Domain	Skill	Difficulty
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ID: 0b52d235

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: 0b52d235 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