

Linear Inequalities

Assertion Reason Questions

Direction: In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R).

Choose the correct answer out of the following choices.

- (a) Both (A) and (R) are true and (R) is the correct explanation of (A).
- (b) Both (A) and (R) are true but (R) is not the correct explanation of (A).
- (c) (A) is true but (R) is false.
- (d) (A) is false but (R) is true.

1.

Assertion (A): If $a < b, c < 0$ then $\frac{a}{c} < \frac{b}{c}$.

Reason (R): If both sides are divided by the same negative quantity, then the inequality is reversed.

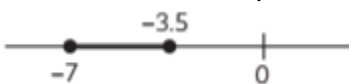
Ans. (d) (A) is false but (R) is true.

Explanation: If both sides are divided by the same negative quantity, then the inequality is

reversed. If $a < b, c < 0$ then $\frac{a}{c} > \frac{b}{c}$.

2. **Assertion (A):** If $-5 \leq 2x + 9 \leq 2$, then $x \in [-7, -3.5]$.

Reason (R): The representation on the number line of $-5 \leq 2x + 9 \leq 2$ is



Ans. (a) Both (A) and (R) are true and (R) is the correct explanation of (A).

Explanation: We have $-5 \leq 2x + 9 \leq 2$

$$= -5 - 9 \leq 2x \leq 2 - 9$$



$$= -14 \leq 2x \leq -7$$

$$\Rightarrow -7 \leq x \leq \frac{-7}{2}$$

$$\therefore x \in \left[-7, \frac{-7}{2}\right]$$

3. Assertion (A): If $11x-9 \leq 68$, then $x \in (-\infty, 7)$.

Reason (R): If an inequality consists of sign $\leq$ or $\leq$, then the point on the line are also included in the solution region.

Ans. (d) (A) is false but (R) is true.

Explanation: We have,

$$11x-9 \leq 68,$$

$$= 11x \leq 77$$

$$= x \leq 7$$

$$\therefore x \in (-\infty, 7]$$

So, assertion is false but the reason is true.

4. Assertion (A): $|3x-5| > 9$

$$\Rightarrow x \in \left(-\infty, \frac{-4}{3}\right) \cup \left(\frac{14}{3}, \infty\right).$$

Reason (R): The reason containing all the solutions of an inequality is called the solution region.

Ans. (b) Both (A) and (R) are true but (R) is not the correct explanation of (A).

Explanation: We have $|3x-5| > 9$

$$= 3x-5 > 9 \text{ or } 3x-5 < -9$$

$$= 3x > 14 \text{ or } 3x < -4$$