Lines and Angles

Assertion & Reason Type Questions

Directions: In the following questions, a statement of Assertion (A) is followed by a statement of a Reason (R). Choose the correct option:

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

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

c. Assertion (A) is true but Reason (R) is false.

d. Assertion (A) is false but Reason (R) is true.

Q1. Assertion (A): If angles 'x' and 'y' form a linear pair of angles and x = 70°, then y = 110°.

Reason (R): Sum of linear pair of angles is always 180°.

Answer : (a) Assertion (A): Given, x = 70°

Since, the sum of linear pair of angles is 180°.

$\therefore x + y = 180°$

$\Rightarrow \quad 70° + y = 180°$

$\Rightarrow \quad y = 110°$

So, Assertion (A) is true.

Reason (R): It is true to say that the sum of linear pair of angles is 180°.

Hence, both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

Q2. Assertion (A): The pair of angles 102°, 78° is supplementary.

Reason (R): The sum of two angles is 180°, then it is supplementary.

Answer : (a) Assertion (A): Here 102° + 78° = 180°.

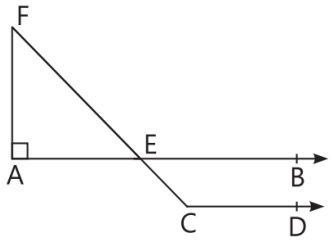
Hence, pair of angles is a supplementary.

So, Assertion (A) is true.

Reason (R): It is true to say that the sum of two angles is 180°, then it is supplementary.

Hence, both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

Q3. Assertion (A): In the adjoining figure, if AB || CD and ∠E = 50°, then ∠BEC is 50°.



Reason (R): If sum of two angles is 90°, then it is complementary.

Answer : (b) Assertion (A): Given ∠FEA = 50°

∠BEC = ∠FEA = 50°

[Vertically opposite angles)

So, Assertion (A) is true.

Reason (R): It is also true to say that in complementary angles, their sum is 90°.

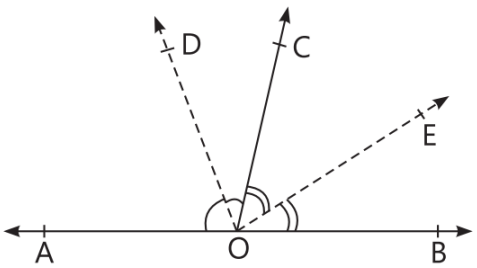
Hence, both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

Q4. Assertion (A): The bisectors of the angles of a linear pair are at right angles.

Reason (R): If the sum of two adjacent angles is 180°, then the non-common arms of the angles are in a straight line.

Answer :

(b) **Assertion (A):** Let AB is a line segment and O be a point lies on the line segment. Let OC be a ray. Construct OD and OE are the angles bisector of ∠AOC and ∠BOC.



By definition of linear pair,

$$\angle AOC + \angle BOC = 180°$$

Divide both sides by 2, we get

$$\frac{1}{2}(\angle AOC + \angle BOC) = \frac{180°}{2}$$

$$\Rightarrow \quad \frac{1}{2}\angle AOC + \frac{1}{2}\angle BOC = 90°$$

$$\Rightarrow \quad \angle DOC + \angle COE = 90°$$

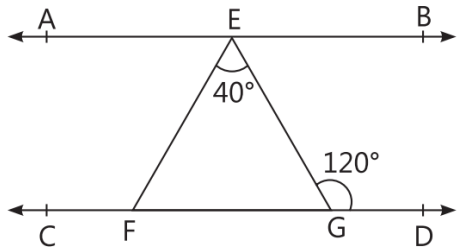
$$\left[\because \text{ OD and OE are the bisectors of } \angle AOC \text{ and BOC, } \therefore \quad \angle DOC = \frac{1}{2}\angle AOC \text{ and } \angle COE = \frac{1}{2}\angle BOC\right]$$

So, Assertion (A) is true.

Reason (R): It is true to say that the sum of two adjacent angles is 180°, then the non-common arms form a straight line.

Hence, both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

Q5. Assertion (A): In the adjoining figure, if AB || CD, then ∠FGE = 60°.



Reason (R): The sum of interior angles of same side of a parallel line intersect by a transversal line is 180°.

Answer : (b) Assertion (A): ∠FGE + ∠EGD = 180°

[By linear pair]

⇒ ∠FGE + 120° = 180°

⇒ ∠FGE = 60°

So, Assertion (A) is true.

Reason (R): It is true to say that the sum of interior angles of same side of a parallel line is 180°.

Hence, both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).