

Triangles

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 we draw two triangles with angles 40° , 60° and 80° and the length of the sides of one triangle be different than that of the corresponding sides of the other triangle, then two triangles are not congruent.

Reason (R): If two triangles are constructed which have all corresponding angles equal but have unequal corresponding sides, then two triangles cannot be congruent to each other.

Answer : (a) Assertion (A): There is no rule of congruency when both triangles have equal corresponding angle but sides are different. So, these two triangles are not congruent.

Therefore, Assertion (A) is true.

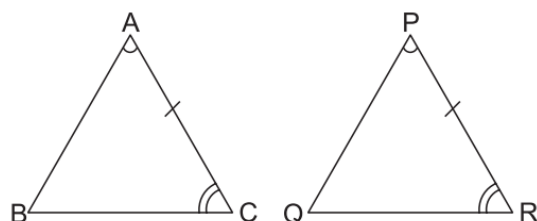
Reason (R): It is also true.

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

Q2. Assertion (A): In triangles ABC and PQR, if $\angle A = \angle P$, $\angle C = \angle R$ and $AC = PR$, then the two triangles are congruent by ASA congruence.

Reason (R): If two angles and included side of a triangle are equal to the corresponding angles and side of the other triangle, then the triangles are congruent by ASA congruence.

Answer : (a) Assertion (A): It is true to say that two angles and the including sides of two triangles are equal then they are congruent by ASA rule.



Reason (R): It is also true.

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

Q3. Assertion (A): In ΔPQR , $PQ = QR$ and $\angle R = 75^\circ$, then $\angle P$ is 52° .

Reason (R): In a triangle, angles opposite to equal sides are equal.

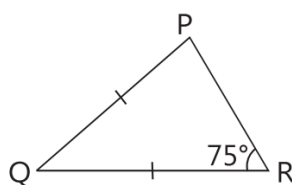
Answer :

(d) **Assertion (A):** In ΔPQR ,

$$PQ = QR$$

$$\Rightarrow \angle R = \angle P = 75^\circ$$

[$\because$ Angles opposite to equal sides are equal]

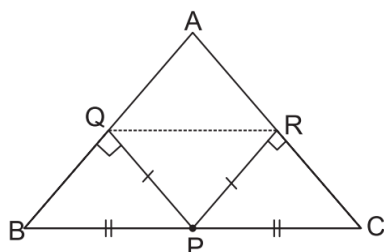


So, Assertion (A) is false.

Reason (R): It is true to say that angles opposite to equal sides of triangle are equal.

Hence, Assertion (A) is false but Reason (R) is true.

Q4. Assertion (A): In ΔABC , P is the mid-point of BC. If $PQ \perp AB$ and $PR \perp AC$, such that $PQ = PR$, then $BQ = CR$.



Reason (R): If two angles and the included side of one triangle are equal to two angles and the included side of other triangle, then two triangles are congruent by ASA rule.

Answer :

(b) **Assertion (A):** In $\triangle PQB$ and $\triangle PRC$,

$$BP = PC \quad [\because P \text{ is the mid-point of } BC]$$

$$\angle Q = \angle R = 90^\circ$$

$[\because \text{Angles opposite to equal sides are equal}]$

and $PQ = PR$ [Given]

$\therefore \triangle PQB \cong \triangle PRC$ [by RHS congruence]

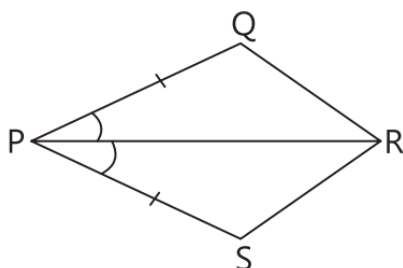
$\Rightarrow BQ = CR$ [By CPCT]

So, Assertion (A) is true.

Reason (R): It is also true.

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

Q5. Assertion (A): In a quadrilateral PQRS, $PQ = PS$ and PR bisects $\angle P$ by SAS congruence rule.



Reason (R): Two triangles are congruent if one hypotenuse side and one of the perpendicular side of triangle is equal to the corresponding one hypotenuse side and one of the perpendicular side of the other triangle.

Answer :

(b) **Assertion (A):** In $\triangle PQR$ and $\triangle PSR$,

$$PQ = PS \quad [\text{Given}]$$

$$\angle RPQ = \angle RPS \quad [\because PR \text{ bisects } \angle P]$$

$$PR = PR \quad [\text{Common}]$$

$\therefore \triangle PQR \cong \triangle PSR$ [by SAS congruence rule]

So, Assertion (A) is true.

Reason (R): It is also true.

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

