

SATISH CHANDRA MEMORIAL SCHOOL
ASSERTION AND REASON & CASE STUDY

Q1: Assertion: The area of a triangle is 8966.56 square cm, with sides measuring 150 cm, 120 cm, and 200 cm.

Reason: Heron's formula = $\sqrt{s(s-a)(s-b)(s-c)}$

- (a) both Assertion and reason are correct and reason is correct explanation for Assertion
- (b) both Assertion and reason are correct but reason is not correct explanation for Assertion
- (c) Assertion is true but reason is false.
- (d) both Assertion and reason are false.

Q2: Assertion: The area of an equilateral triangle with a side of 4 cm is $4\sqrt{3}$ cm².

Reason: Area of an equilateral triangle = $(\sqrt{3}/4) \times a^2$

Q3: Assertion: Perimeter of a triangle = $(a+b+c)/2$

Reason: If the sides of the triangle are 30m, 24m, and 22m, then its perimeter is 76m.

Q4: Assertion: The side of an equilateral triangle is 6 cm, then the area of the triangle is $9\sqrt{3}$ cm².

Reason: All the sides of an equilateral triangle are equal.

Q5: Assertion: The height of an equilateral triangle is $\sqrt{3}/2$ times its side length (a).

Reason: If the side of an equilateral triangle is 6 cm, then the height is 9 cm.

Q6: Assertion: The area of a triangle is 6 cm² with sides measuring 3 cm, 4 cm, and 5 cm.

Reason: Area of a triangle = $\sqrt{s(s-a)(s-b)(s-c)}$

Q7: Assertion: Area of a triangle = $\sqrt{s(s-a)(s-b)(s-c)}$

Reason: $s = (a+b+c)/2$

Q8: Assertion: If $2S = (a+b+c)/2$ and the sides of a triangle are 3cm, 4cm, and 5cm, then the area = $\sqrt{s(s-a)(s-b)(s-c)}$.

Reason: The area of a triangle with sides 3cm, 4cm, and 5cm is 6cm².

Q9: Assertion: In a right-angled triangle, if the hypotenuse is $5\sqrt{2}$ cm, then the other two sides are equal to 5 cm each.

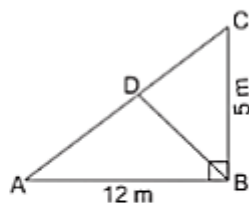
Reason: In a right-angled triangle, $\text{base}^2 + \text{perpendicular}^2 = \text{hypotenuse}^2$.

Q10: Assertion: The height of a triangle is 18 cm, its area is 72 cm², and its base is 8 cm.

Reason: Area of a triangle = $1/2 \times \text{base} \times \text{height}$.

CASE STUDY 1

Mayank bought a triangle shape field and wants to grow potato and wheat on his field. He divided his field by joining opposite sides. On the largest park he grew wheat and on the rest part he grew potato. The dimensions of a park are shown in the park.



On the basis of the above information, solve the following questions:

Q1. Find the length of AC in a ΔABC .

Q2. Find the area of ΔABC .

Q3. If the cost of ploughing park is ₹ 5 per cm^2 , then find the total cost of ploughing the park.

CASE STUDY 2

The sides of a rectangular park are 80 m and 90 m respectively. A small triangular area of side 8m, 10m and 6m respectively is to be left out at the four corners of the park for growing flowering plants. The remaining area is be planted with natural grass.



Q1.	What is the area of the rectangular garden?
Q2.	What is the semi-perimeter of the triangle for the above measurements?
Q3.	Find the area used for growing flowering plants.
Q4.	If the cost of planting the flowering plant is ₹ 75.50 per m^2 , then find the total cost of planting the flowering plants.
Q5.	Find the area of the grass to be planted.

CASE STUDY 3

Triangles are used in bridges because they evenly distribute weight without changing their proportions. When force is applied on a shape like rectangle it would flatten out. Before triangles were used in bridges, they were weak and could not be very big. To solve that problem engineers would put a post in the middle of a square and make it more sturdy. Isosceles triangles were used to construct a bridge in which the base and equal sides of an isosceles triangle are in the ratio 1:2:2 and its perimeter is 200 m.



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| 1. | What is the value of the common ratio? |
| 2. | What are the measurements of the sides of an isosceles triangle? |
| 3. | Find the semi-perimeter of the above triangle. |
| 4. | What is the area of the above isosceles triangle? |
| 5. | Find the cost of painting the so formed triangle at the rate of ₹ 18.25 per m^2 . |