Billabong High International School, Malad
Bhoomi Park, Bafhira Nagar, Malad West, Mumbai –400095
Email –info.malad@billabonghighschool.com Contact: 022-49480808

Subject: Mathematics **Topical Worksheet: 9** **Grade:9**
Chapter: Heron's Formula

MULTIPLE CHOICE QUESTIONS (1 MARK EACH)

1. The length of each side of an equilateral triangle having an area of $9\sqrt{3}$ cm^2 is: **[1]**

   (a) 8 cm (b) 36 cm (c) 4 cm (d) 6 cm

2. The perimeter of an equilateral triangle is 60 m. Its area is: **[1]**

   (a) $10\sqrt{3}$ m^2 (b) $15\sqrt{3}$ m^2 (c) $20\sqrt{3}$ m^2 (d) $100\sqrt{3}$ m^2

3. The height of an equilateral triangle is 6 cm. Its area is: **[1]**

   (a) $12\sqrt{3}$ cm^2 (b) $6\sqrt{3}$ cm^2 (c) $12\sqrt{3}$ cm^2 (d) 18 cm^2

4. The lengths of three sides of a triangle are 20 cm, 16 cm and 12 cm. The area of the triangle is: **[1]**

   (a) 96 cm^2 (b) 120 cm^2 (c) 144 cm^2 (d) 160 cm^2

5. Sides of a triangle are 8 cm, 11 cm and 13 cm. Then value of semi-perimeter is: **[1]**

   (a) 19 cm (b) 20 cm (c) 21.5 cm (d) 16 cm

6. The lengths of the three sides of a triangular field are 40 m, 24 m and 32 m respectively. The area of the triangle is: **[1]**

   (a) 480 m² (b) 320 m² (c) 384 m² (d) 360 m^2

7. **Assertion (A):** The area of an equilateral triangle having side 4 cm is 3 cm^2. **[1]**
   Reason (R): The area of an equilateral triangle having each side a is $\frac{\sqrt{3}}{4}a^2$.

   (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.

8. **Assertion (A):** The area of a triangle with sides 3 cm, 4 cm, and 5 cm is 6 cm^2. **[1]**
   Reason (R): For a triangle with sides a, b, and c, the area can be found using the formula $\sqrt{s\,(s-a)(s-b)(s-c)}$, where $s = \frac{a+b+c}{2}$.

Subject: Mathematics **Topical Worksheet: 9** **Grade:9**
Chapter: Heron's Formula

(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.

VERY SHORT ANSWER QUESTIONS (2 MARKS EACH)

9. Find the cost of laying grass in a triangular field of sides 91 m, 98 m and 105 m at the rate of ₹2 per cm^2. **[2]**

10. If the perimeter of the isosceles triangle is 22 cm and the base is 10 cm, then what is the area of the isosceles triangle? **[2]**

11. The perimeter of an equilateral triangle is 60 cm. Find its area. (Use $\sqrt{3} = 1.73$) **[2]**

12. If each of the two equal sides of an isosceles right triangle is 15 cm long, then find its area. **[2]**

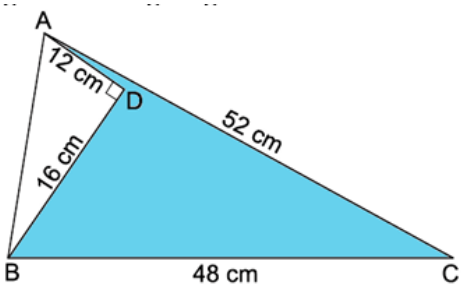
SHORT ANSWER QUESTIONS (3 MARKS EACH)

13. The perimeter of an isosceles triangle is 32 cm. The ratio of the equal side to its base is 3:2. Find the area of the triangle. **[3]**

14. The length of the sides of a triangle are 4 cm, 6 cm and 8 cm. Find the length of perpendicular from the opposite vertex to the side whose length is 8 cm. **[3]**

15. The perimeter of a triangular field is 420 m and its sides are in the ratio 6: 7: 8. Find the area of the triangular field. **[3]**

16. Find the area of the shaded region in the figure given below. **[3]**



Billabong High International School, Malad
Bhoomi Park, Bafhira Nagar, Malad West, Mumbai –400095
Email –info.malad@billabonghighschool.com Contact: 022-49480808

Subject: Mathematics **Topical Worksheet: 9** **Grade:9**
Chapter: Heron's Formula

LONG ANSWER QUESTIONS **(5 MARKS EACH)**

17. A gardener has to put double fence all around a triangular field with sides 120 m, 80 m and 60 m. In the middle of each of the sides, there is a gate of width 10 m. **[5]**

(i) Find the length of wire needed for fencing.
(ii) Find the cost of fencing at the rate of ₹ 6 per metre.
(iii) Find the area of triangular field.

18. A rectangular hallway measures 12 m by 16 m. If the hallway is to be tiled and each square tile covers an area of 700 cm^2, then **[5]**

(i) Find the area of the hallway using heron's formula.
(ii) Find out how many tiles are needed to cover the entire floor?

CASE STUDY BASED QUESTIONS **(4 MARKS EACH)**

19. **CASE STUDY-I** **[4]**

A craft mela is organized by a Welfare Association to promote the art and culture for tribal people. Fairs and festivals are the custodians of our great cultural heritage. The pandal is to be decorated by using triangular flags around the field. Each flag has dimensions 25 cm, 25 cm and 22 cm.

(i) What is the semi-perimeter of the flag for the above mentioned dimensions?
(ii) What is the area of the flag?(Use $\sqrt{14} \cong 3.74$).
(iii) Find the area of cloth required for making 300 such flags in m^2.
(iv) If the rate of the cloth is ₹ 200 per m^2, find the total cost of 300 flags.

OR

(iv) Find the area of cloth required for making 1500 such flags in cm^2.

Subject: Mathematics **Topical Worksheet: 9** **Grade:9**
Chapter: Heron's Formula

20. **CASE STUDY-II** **[4]**

Triangles are used in bridges because they evenly distribute weight without changing their proportions. When force is applied on a shape like a 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 (unequal side) of an isosceles triangle is 4 m and its perimeter is 20 m.

(i) What is the length of equal sides?
(ii) In a ΔABC it is given that base = 12 m and height = 5 m. Find its area.
(iii) What is the area of the given isosceles triangle?

OR

(iii) Find the cost of covering the border of one isosceles triangle at the rate of ₹ 200 per metre.