MATHEMATICS
WORKSHEET_190425
CHAPTER-10 HERON'S FORMULA

SUBJECT: MATHEMATICS   **MAX. MARKS : 40**

CLASS : IX   **DURATION : 1½ hrs**

General Instructions:
(i).   **All** questions are compulsory.
(ii).   This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.
(iv).   There is no overall choice.
(v).   Use of Calculators is not permitted

SECTION – A
Questions 1 to 10 carry 1 mark each.

1. The lengths of the three sides of a triangle are 30 cm, 24 cm and 18 cm respectively. The length of the altitude of the triangle corresponding to the smallest side is
    (a) 24 cm   (b) 18 cm   (c) 30 cm   (d) 12 cm

2. Each side of an equilateral triangle is 10 cm long. The height of the triangle is
    (a) $10\sqrt{3}$ cm   (b) $5\sqrt{3}$ cm   (c) $10\sqrt{2}$ cm   (d) 5 cm

3. The area of an equilateral triangle with side $2\sqrt{3}$ cm is (use $\sqrt{3} = 1.732$)
    (a) 5.196 cm²   (b) 0.866 cm²   (c) 3.496 cm²   (d) 1.732 cm²

4. If the area of an equilateral triangle is $16\sqrt{3}$ cm², then the perimeter of the triangle is
    (a) 48 cm   (b) 24 cm   (c) 12 cm   (d) 36 cm

5. The base of an isosceles triangle is 16 cm and its area is 48 cm2. The perimeter of the triangle is
    (a) 41 cm   (b) 36 cm   (c) 48 cm   (d) 324 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
    (a) 480 m²   (b) 320 m²   (c) 384 m²   (d) 360 m2

7. Each of the equal sides of an isosceles triangle is 13 cm and its base is 24 cm. The area of the triangle is
    (a) 156 cm^2 (b) 78 cm^2 (c) 60 cm^2 (d) 120 cm^2

8. The sides of a triangle are 56 cm, 60 cm and 52 cm long. Then the area of the triangle is
    (a) 1322 cm²   (b) 1311 cm²   (c) 1344 cm²   (d) 1392 cm²

In the following questions 9 and 10, 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.

9. **Assertion (A):** Area of an equilateral triangle having each side 4 cm is $10\sqrt{3}$ cm^2

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

10. Assertion (A): Area of a triangle whose sides are 9 cm, 12 cm and 15 cm is 54 cm².

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

SECTION – B
Questions 11 to 14 carry 2 marks each.

11. The base of an isosceles triangle is 10 cm and one of its equal sides is 13 cm. Find its area using Heron's formula.

12. The length of two adjacent sides of a parallelogram are respectively 51 cm and 37 cm. One of its diagonal is 20 cm. Find the area of the parallelogram.

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

14. Find the area of triangle whose sides are 18 cm, 24 cm and 30 cm.

SECTION – C
Questions 15 to 17 carry 3 marks each.

15. Find the area of a triangle whose perimeter is 180 cm and its two sides are 80 cm and 18 cm. Calculate the altitude of triangle corresponding to its shortest side.

16. The sides of a triangle are in the ratio 13 : 14 : 15 and its perimeter is 84 cm. Find the area of the triangle.

17. Find the area of shaded region in the given figure. (All measurements are in cm)
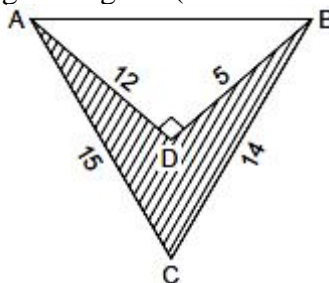

SECTION – D
Questions 18 carry 5 marks.

18. 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.
(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.

SECTION – E (Case Study Based Questions)
Questions 19 to 20 carry 4 marks each.

19. Under Swachh Bharat Mission, a school management suggested teachers as well as students to organize Marathon Running on 2nd October in memory of Mahatma Gandhi. Both teachers and students of school dramatically made a gathering for spotlessness drive. They walked throughout the following paths in two groups. One group walked through the paths PQ QR and RP whereas the

other through PR, RT and TP (As shown in figure). Then they ran over the area enclosed within their paths. If PQ = 7m, QR = 30m, RT =10m, TP = 25m and ∠Q = 90°.

P — 25 m — T

7 m

90°

Q — 30 m — R

10 m
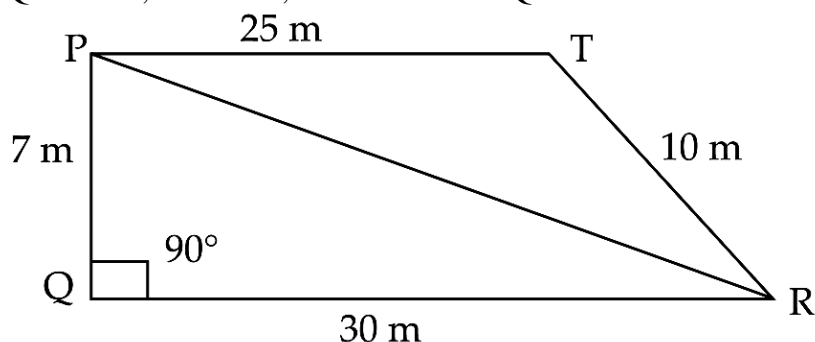
Analyze the above information answer the following questions:
(i) What is the value of longest path which is covered by Marathon participants? (1)
(ii) Find the value area of triangle PQR in which first group is running Marathon? (1)
(iii) How much area is covered by Group 2 of triangles PRT? (2)

20. There is a road running across the city, which is also a connecting road between the 2 towns. Due to this busy road, lot of traffic generally occurs on this road. To get rid of it a flyover was made on it. The triangular side walls of a flyover have been used for advertisements. The sides of the walls are 122m, 22m and 120 m.

122m
22m
120m
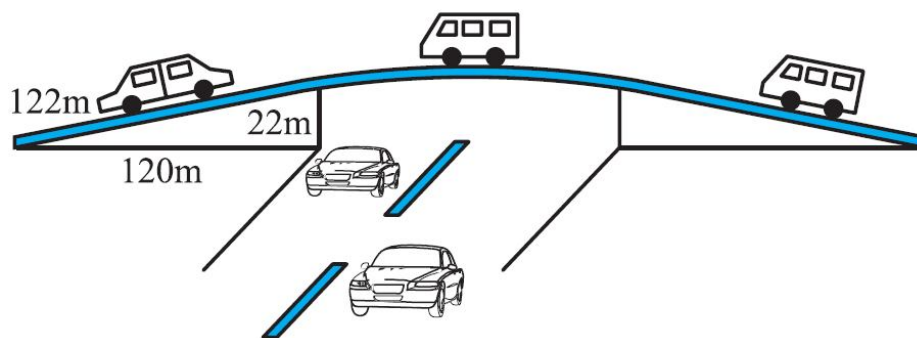
(i) What type of triangle is the side wall of the flyover? (1)
(ii) If there are 2 walls for the advertisement what is the total area of the 2 walls? (1)
(iii) If the advertisements yields an earning of Rs. 6,000 m² per year. What is the monthly rent for 2 walls? (1)
(iv) If a company hires these 2 walls for 4 months, how much rent they need to pay? (1)