Very-Very Short Answer Type Questions (1 Mark)

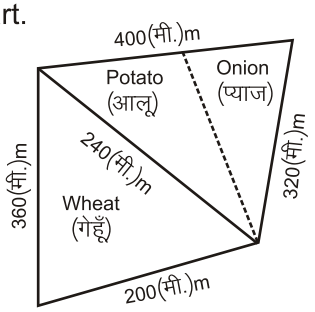
1. Find the areas of a triangle whose base and attitude are 6cm and 3cm respectively.
2. The area of a triangle of base 35cm is 420 sq.cm. Find its altitude.
3. Find the area of a triangle whose base is 15cm long and the corresponding height is 9.8cm.
4. Find the area of an equilateral triangle with side $2\sqrt{3}$cm.
5. Find the area of an equilateral triangle of side 'a' units.
6. Find the area of an isosceles triangle each of whose equal sides is 13cm and base is 24cm.
7. The height of an equilateral triangle is 6cm. Find its side.
8. Find the semi-perimeter of an equilateral triangle of side 2a units.
9. For an isosceles triangle having base b and each of equal side a, find its perimeter.
10. Two sides of a triangle are 8cm and 11cm and perimeter of it is 32cm. Find the length of third side.
11. Find the length of the diagonal of a rectangle whose length is 'a' units and breadth is 'b' units.
12. Find the area of a regular hexagon, whose side is 'a' units.
13. Find the area of a parallelogram whose base is 12cm and altitude is 5.5cm.
14. The base and the corresponding altitude of a parallelogram are 10cm and 8.5cm respectively. Find the area of the parallelogram.
15. If the length of a median of an equilateral triangle is x cm, find its area.
16. If the sides of an equilateral triangle are tripled, then find its new area.
17. Each side of an equilateral triangle is $2x$ cm. If $x\sqrt{3} = 48$, then find its area.
18. If the sides of a triangle are 13cm, 14cm and 15cm. Then find the area of the triangle.
19. Find the area of a trapezium whose parallel sides are 25cm and 13cm long and distance between them is 8cm.
20. Find the area of the triangle having perimeter 32cm, one side 11cm and difference of other two sides is 5cm.

CASE STUDY BASED QUESTION (4 MARKS)

21. Sarla Devi has a triangular field with sides 240m, 200m and 360m, where

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she grew wheat. In another triangular field with sides 240m, 320m and 400m adjacent to the previous field, she wanted to grow potatoes and onions. For this, she divided the field in two parts by joining the mid-point of the longest side to the opposite vertex and grew potatoes in one part and onions in the other part.



Based on the above information, answer the questions :-

(i) What is the area of the wheat field ?

a) 16000 m^2 b) 16000 $\sqrt{2}m^2$ c) 32000m^2 d) 8000 m^2

(ii) What is the area of the field used for growing potatoes ?

a) 3.8400m^2 b) 38400m^2 c) 38.400m^2 d) 3.84m^2

(iii) What is the area of the field used for growing onions ?

a) 3.84m^2 b) 38.400m^2 c) 38400m^2 d) 3.84km^2

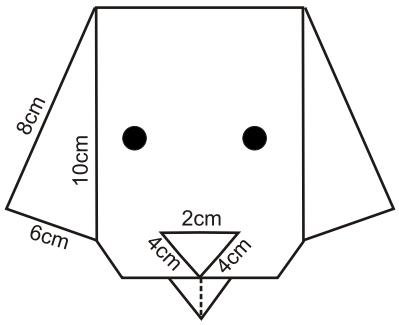
(iv) The ratio of the areas of the fields used for growing potatoes and onions is

a) 1:1 b) 1 : 2 c) 2:1 d) 2 : 2

(v) What will be the total area of land she has in hectare?

a) 6 hectare b) 6.1 hectare c) 6.2 hectare d) 6.3 hectare

22. During summer vacations, Rohit was getting bored due to lockdown in his city. Because of the COVID pandemic, he couldn't go out to play with his friends. His mother suggested him to start making some origami craft material. He learnt origami craft through internet and made a puppy as shown in figure.



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Based on the above information and measurements of different parts of the figure, answer the following questions :-

(i) What is the area of one of ears of the puppy ? (both ears are similar)

a) $20cm^2$ b) $22cm^2$ c) $24cm^2$ d) $26cm^2$

(ii) What is the area of the paper used to make nose of the puppy ?

a) $24\sqrt{5}cm^2$ b) $12\sqrt{5}cm^2$ c) $\sqrt{5}cm^2$ d) $\sqrt{15}cm^2$

(iii) If the tongue of the puppy is in the shape of an equilateral triangle, with side 2cm each, then what is the area of the paper used to make tongue?

a) $\sqrt{3}cm^2$ b) $3cm^2$ c) $3\sqrt{3}cm^2$ d) $9cm^2$

(iv) What will be the length of the middle line of the tongue as shown in figure?

a) $\sqrt{3}$cm b)3cm c) $3\sqrt{3}$cm d) 9cm

(v) If the total area of paper used to make the puppy is $96cm^2$, then find the area of paper used to make the face (except ears, nose and tongue) of the puppy.

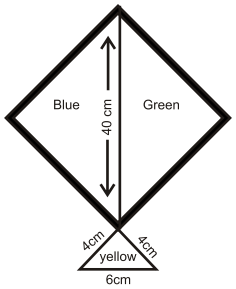
a) $(48-\sqrt{15}-\sqrt{3})cm^2$

b) $(48-\sqrt{15})cm^2$

c) $(48-\sqrt{3})cm^2$

d) $48cm^2$

23. Vansh wanted to fly kite on the eve of Independence day. But the shops were all closed due to lockdown during COVID pandemic. His sister offered to make a kite using waste papers. Vansh agreed and they both made a beautiful Kite. The kite was in the shape of a square and an isosceles triangle. The diagonal of the square part was 40cm and the isosceles triangle was of base 6cm and sides 4cm. The diagonal was dividing the square part of the kite into two triangles. One triangle was of blue colour and the other one was of green colour. The isosceles triangle part was of yellow colour. Base on the above information, answer the following questions :-



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(i) What is the length of one side of the square ?

(a) 20cm (b) $20\sqrt{2}$cm (c) $\sqrt{2}$cm (d) 40cm

(ii) Vansh wanted to decorate the square part of the kite with paper strip. What length of the paper strip he had to use ?

(a) $40\sqrt{2}$cm (b) $80\sqrt{2}$cm (c) 800cm (d) 40cm

(iii) What is the area of the square part ?

(a) $400\sqrt{2}cm^2$ (b) $800\sqrt{2}cm^2$ (c) $800cm^2$ (d) $400cm^2$

(iv) What is the area of the triangular part (yellow colour) ?

(a) $14\sqrt{3}cm^2$ (b) $63cm^2$ (c) $3\sqrt{7}cm^2$ (d) $7\sqrt{3}cm^2$

(v) What is the area of the blue part of the kite ?

(a) $200\sqrt{2}cm^2$ (b) $400\sqrt{2}cm^2$ (d) $400cm^2$ (d) $200cm^2$

Very Short Answer Type Questions (2 marks)

24 Find the area of an equilateral triangle whose sides are 4cm each.

25. If sum of two sides of a triangle is 17cm and its perimeter is 30cm, then what is the length of third side?

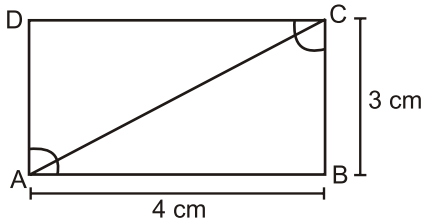
26. If perimeter of a triangle is 24cm and sides are in the ratio 2:1:3, then find the longest side .

27. If each side of a triangle is double then how many times the perimeter of triangle increased ?

28. If area of a triangle is $50cm^2$ and one of its sides is 10cm then find the length of corresponding altitude.

29. The area of an equilateral triangle is $16\sqrt{3}\ cm^2$ then what will be the length of each side of that triangle?

30. Find the ratio between the area ΔABC and area ΔACD of the given rectangle.



31. A square has each side of 5cm. Find the length of one of its diagonals.

32. If the length and corresponding height of a parallelogram are 10cm and 8cm then find the area of a triangle made by its diagonal.

33. The sides of a triangle are 11cm, 60cm and 61cm. Find the altitude to the smallest side.

34. The ratio between the sides of a triangle are 3 : 5 :7 and its perimeter is 300cm. Find the sides of triangle.

35. Find the area of isosceles triangle whose non equal side is of 12cm and its corresponding altitude is 7.5cm.

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36. The sides of a triangular field are 51m, 37m and 20m. Find the number of flower beds that can be prepared if each bed is to occupy $9m^2$ of area.

37. A rectangular plot is given for constructing a house having measurement of 40m long and 15m broad. According to the laws, a minimum of 3m wide space should be left in the front and back each and 2m wide space on each of other sides. Find the largest area, where house can be constructed.

38. Show that the Area of an equilateral triangle is $\frac{\sqrt{3}}{4} x^2$, where side is x.

39. Perimeter of an isosceles triangle is 32 cm. The ratio of equal side to its base is 3 : 2. Find area of this triangle.

40. The sides of a triangle are x, x+1, 2x-1 and its area is $x\sqrt{10}$ sq. units. Find the value of x.

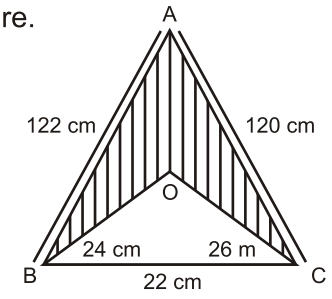
Short Answer Type Questions (3 marks)

41. The area of a quadrilateral is $360m^2$ and the perpendiculars drawn to one of the diagonal from the opposite vertices are 10m and 8m. Find the length of the diagonal.

42. The adjacent sides of a parallelogram ABCD are AB=34, BC=20cm and diagonal AC=42cm. Find the area of the parallelogram.

43. The perimeter of a triangle is 50cm. One side of a triangle is 4cm longer than the smaller side and the third side is 6cm less than twice the smaller side. Find the area of the triangle.

44. Find the area of shaded region in the figure.



How may triangular flower beds of $6m^2$ can be made from this area?

use $\sqrt{105} = 10.25$

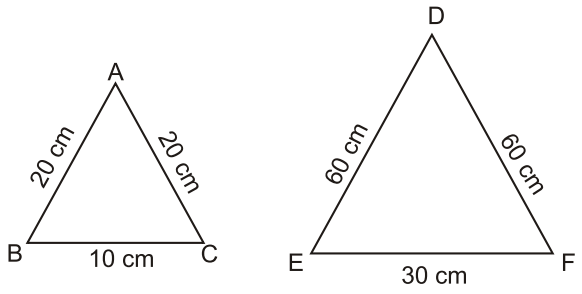
45. Find the area of rhombus whose perimeter is 100m and one of whose diagonal is 30m.

46. The sides of a triangular sheet are 5 cm, 12 cm and 13 cm. Find the cost of painting on the sheet at the rate of ₹ 30 per cm^2.

47. One side of a right angled triangle is 20 cm and the difference in lengths of its hypotenuses & other side is 8 cm. Find the other side and area of the triangle.

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48. Find the ratio between the area of triangle ΔABC and ΔDEF.

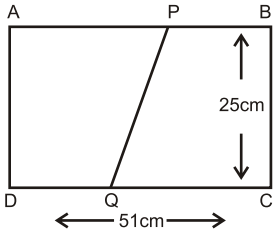


49. If perimeter of a triangle is x cm and its sides are p, q and r cm. What will be the area of triangle ? Use the Heron's formula.

50. If each side of equilateral triangle is doubled, then find the ratio of area of new triangle formed and the given triangle.

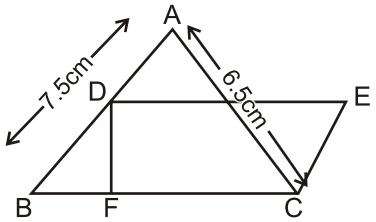
51. If every side of a equilateral triangle is doubled, then find the percent age increase in the area of the triangle.

52. The dimensions of a rectangle ABCD are 51cm x 25cm. A trapezium PBCQ with its parallel sides QC and PB in the ratio 9:8 is cut off from the rectangle as shown in figure. If the area of the trapezium PBCQ is $\frac{5}{6}$ part of the area of the rectangle, then find the lengths of QC and PB.



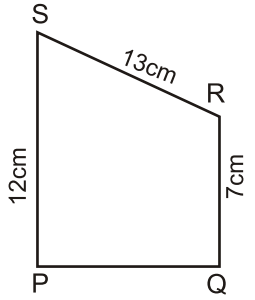
53. A triangle and a parallelogram have the same base and the same area. If the sides of the triangle are 13cm, 14cm and 15cm and the parallelogram stands on the base 14cm, then find the height of the parallelogram.

54. In the given figure, ΔABC has sides AB=7.5cm, AC=6.5cm and BC=7cm. On base BC, a parallelogram DBCE of same area as that of ΔABC is constructed. Find the height DF of the parallelogram.



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55. Find the area of the trapezium PQRS, with height PQ, which is given in the figure below.

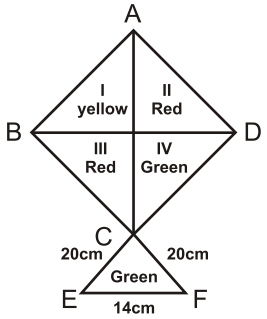


56. Anita has a piece of land which is in the shape of a rhombus. She has two children. one daughter Preetika and one son Naresh to work on the land and produce different types of crops. She divided the land in two equal parts. If the perimeter of the land is 200m and one of the diagonal is 70m then

    (i) How much area will each of them get for their crops ?

    (ii) Anita fenced the land by wires. How much wire is required to fence the land ?

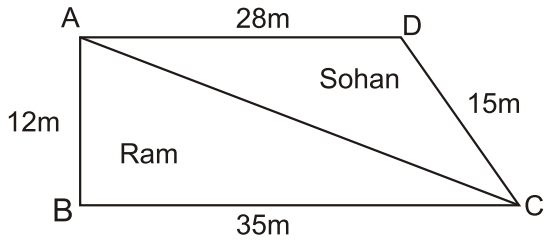
57. How much paper of each shade is needed to make a kite given in the figure in which ABCD is a square with diagonal 44cm ?



58. While selling clothes for making flags, a shopkeeper claims to sell each piece of cloth in the shape of an equilateral triangle of each side 10cm while actually he was selling the same in the shape of an isosceles triangle with sides 10cm, 10cm and 8cm. How much cloth was he saving in selling each flag ?

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59. A piece of land is in the shape as given in the figure, has been cut along diagonal AC. The two pieces of land has been distributed between Ram and Sohan. Who will get larger piece of land in terms of area ? [Use $\sqrt{10}=3.15$]



60. A triangular hoarding of dimensions 11m, 6m and 15m is used for commercial activities. The hoarding yield an earning of ₹ 5000 per m^2 per month.

Calculate the total earning by the hoarding in a month. [Use $\sqrt{2} = 1.41$]

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CHAPTER-12
HERON'S FORMULA
ANSWERS

1. 9 sq cm
2. 24cm
3. 73.5 sq. cm
4. $3\sqrt{3}$ sq. cm
5. $\frac{\sqrt{3}}{4}a^2$ sq. units
6. 60 sq. units
7. $4\sqrt{3}$cm
8. 3a units
9. 2a + b
10. 13cm
11. diagonal = $\sqrt{a^2 + b^2}$ units
12. $\frac{3}{2}\sqrt{3}a^2$
13. 66 sq. cm.
14. 35 sq. cm.
15. Hint :- for an equilateral triangle, altitude = median
    Ans : $\frac{x^2}{\sqrt{3}}$ cm^2
16. New area = 9 x area
17. $768\sqrt{3}$ sq. cm.
18. 84 sq. cm.
19. 152 sq. cm.
20. $8\sqrt{30}$ sq. cm.
21. (i) (b) $16000\sqrt{2}m^2$
    (ii) (b) 38400 m^2
    (iii) (c) 38400 m^2
    (iv) (a) 1 : 1
    (v) (b) 6.1 hectare
22. (i) (c) 24 cm^2
    (ii) (d) $\sqrt{15}$ cm^2

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(iii) (a) $\sqrt{3}cm^2$

(iv) (a) $\sqrt{3}$ cm

(v) (a) $(48 - \sqrt{15} - \sqrt{3})\ cm^2$

23. (i) (b) $20\sqrt{2}$cm

(ii) (b) $80\sqrt{2}$cm

(iii) (c) 800 cm^2

(iv) (c) $3\sqrt{7}cm^2$

(v) (c) 400 cm^2

24. $4\sqrt{3}\ cm^2$

25. 13cm

26. 12cm

27. 2 times

28. 10cm

29. 8cm

30. 1 : 1

31. $5\sqrt{2}$cm

32. $40cm^2$

33. 60cm

34. 60cm, 100cm, 140cm

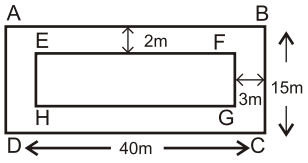
35. $45cm^2$

36. Hint: No of flower beds = $\frac{\text{Area of field}}{\text{Area of 1 Flower Bed}}$

Ans : 34

37. $374m^2$

Hint :



Find area of EFGH

39. $32\sqrt{2}cm^2$

40. 6

41. 40m

42. $672cm^2$

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43. Hint : Let the length of smallest side = x m

$\therefore$ Other two sides will be x + 4 and 2x - 6

$\therefore$ Perimeter of triangle = x + x + 4 + 2x - 6

50 = 4x - 2

x = 13

$\therefore$ sides are 13, 17, 20cm

Ans = 109.6 cm^2

44. 1047m^2, 179

45. 600m^2

46. ₹900

47. Hint :

Let given side 'a' = 20

hypotenuse = b

other side = c

$a^2 = b^2 - c^2$

$a^2 = (b-c)(b+c)$

$20^2 = 8 \times (b+c)$

$\frac{400}{8} = b + c$

b+c = 50

b-c = 8 (given)

2b = 58

b = 29

$\therefore$ c = 21

a=20, b=29, c=21

Area = 210cm^2

48. 1 : 9

49. $\sqrt{\frac{x}{2}\left(\frac{x}{2}-p\right)\left(\frac{x}{2}-q\right)\left(\frac{x}{2}-r\right)}$

50. 4:1

51. 300% [Hint : Increase in area

of triangle = Area of new triangle – Area of given triangle

Percentage Increase = $\frac{\text{Increased Area}}{\text{Initial Area}} \times 100$

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52. Hint :

Area of trapezium = $\frac{5}{6}$ Area of rectangle ..... (i)

Also Area of trapezium = $\frac{1}{2} \times \left(\begin{matrix}\text{Sum of}\\ \text{parallel}\\ \text{sides}\end{matrix}\right) \times \left(\begin{matrix}\text{distance}\\ \text{between}\\ \text{parallel}\\ \text{sides}\end{matrix}\right)$ ..... (ii)

Take parallel sides of trapezium as 9x & 8x and equate equations (i) & (ii)

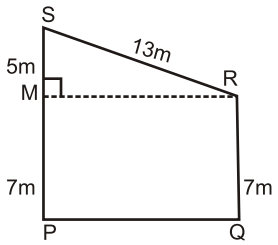
Ans. QC = 45cm

PB = 40cm

53. 6cm

54. 3cm

55.



Hint : Find MR using pythagoras from ΔSMR

$\Rightarrow$ MR = PQ

Then find area of trapezium

Ans. 114m^2

56. (i) $175\sqrt{51} cm^2$

(iii) 200m

57. Area of red paper = 484cm^2

Area of yellow paper = 242cm^2

Area of green paper = 373.14cm^2

58. 6.61cm^2

59. Ram, 210m^2

60. ₹141000

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PRACTICE TEST

HERON'S FORMULA

Time : 1 hour M.M. 25

1. Find the length to sides of an equilateral triangle having area $a\sqrt{3}\ cm^2$. 1

2. If (s – a) = 5 cm, (s – b) = 10 cm, (S – C) = 1 cm. Find S. 1

3. The sides of triangle are 35cm, 54cm and 61cm. Find the length of its longest altitude. 1

4. Find the area of isosceles triangle whose equal sides are of length 15 cm each & the third side is 12 cm. 2

5. If each side of triangle is doubled, then find the ratio of area of new triangle thus formed & the given triangle. 2

6. A triangular park ABC has sides 120m, 80m and 50m. A gardner has planted some trees inside the park leaving 5m width along each side of park. Find the area in which he planted the trees. 2

7. The sides of a triangle are in the ratio 25 : 17 : 12 and its perimeter is 540 cm. Find the area of the triangle. 3

8. The area of trapezium is 475 cm^2 & height is 19 cm. Find length of its parallel sides if one side is 4 cm greater than the other. 3

9. The length of sides of a triangle are 7 cm, 12 cm & 13 cm. Find the length of perpendicular from opposite vertex to the side whose length is 12 cm. 5

10. The cost of fencing a field @ ₹ 5 per metre is ₹ 1920. If semi perimeter is 48 cm, find its area & all sides. 5

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