

CLASS - 7th

Mathematics Chapter : 11

Perimeter and Area.

Exercise 11.1

Ques I

Find the Perimeter and area of rectangle having

- (i) Length = 28cm Breadth = 15cm
(ii) Length = 9.4cm Breadth = 2.5cm.

Soln : (i) $L = 28\text{cm}$ $B = 15\text{cm}$

$$\begin{aligned}\text{Perimeter of Rectangle} &= 2(L+B) \\ &= 2(28+15) \\ &= 2 \times 43 = 86\text{cm}.\end{aligned}$$

$$\begin{aligned}\text{Area of Rectangle} &= L \times B \\ &= 28 \times 15 = 420\text{cm}^2\end{aligned}$$

(ii) $L = 9.4\text{cm}$ $B = 2.5\text{cm}$

$$\begin{aligned}\text{Perim.} &= 2(L+B) \\ &= 2(9.4+2.5) \\ &= 2(11.9) = 23.8\text{cm}\end{aligned}$$

$$\begin{aligned}\text{Area} &= L \times B \\ &= 9.4 \times 2.5 = 23.5\text{cm}^2\end{aligned}$$

Ques: 2

Find the Perimeter and the area of a square whose side measures:

- (i) 29cm (ii) 8.3cm

Ans :- (i) Perimeter of square = $4 \times \text{side}$
 $= 4 \times 29 = 116\text{cm}$

$$\begin{aligned}\text{Area of square} &= \text{side} \times \text{side} \\ 29 \times 29 &= 841\text{cm}^2\end{aligned}$$

(ii) Perimeter = $4 \times 8.3 = 33.2\text{cm}$

$$\begin{aligned}\text{Area} &= 8.3 \times 8.3 = 68.89\text{cm}^2\end{aligned}$$

Ques 3 The Perimeter of a square park is 148m. Find its area. (9)
Soln :- Perimeter = $4 \times \text{side}$

$$4 \times \text{side} = 148$$
$$\text{side} = \frac{148}{4} = 37 \text{m}$$

$$\text{Area} = 37 \times 37 = 1369 \text{m}^2$$

Ques 4 The area of rectangle is 580cm^2 . Its length is 29cm. Find its breadth and perimeter.

Soln :-

$$\text{Area} = L \times B$$

$$580 = 29 \times B$$

$$B = \frac{580}{29} = 20 \text{cm}$$

$$\text{Perimeter} = 2(L+B)$$

$$= 2(29+20)$$

$$= 2 \times 49 = 98 \text{cm}$$

Ques 5 A wire is in the shape of a rectangle. Its length is 48cm and breadth is 32cm. If the same wire is rebent into the shape of a square, what will be the measure of each side. Also find which shape encloses more area and by how much?

Ans :- Area of rectangle = $L \times b$

$$= 48 \times 32 = 1536 \text{cm}^2$$

$$\text{Perimeter of rectangle} = \text{Perimeter of square}$$

$$2[48+32] = 4 \times \text{side}$$

$$2 \times 80 = 4 \times \text{side}$$

$$\text{side} = \frac{160}{4} = 40$$

$$\text{Area of square} = 40 \times 40 = 1600 \text{cm}^2$$

So square encloses more area i.e. 64cm^2 .

Ques: 6 The area of a square park is the same as that of rectangular park. If the side of square park is 75m and the rectangular park is 125m, find the breadth of the rectangular park. Also, find the perimeter of rectangular park.

Soln:- Area of square is $= 75 \times 75 = 5625 \text{ m}^2$
 area of rectangular park $= L \times B$

$$125 \times B = 5625$$

$$B = \frac{5625}{125} = 45 \text{ m}$$

$$\begin{aligned} \text{Now Perimeter of rectangle} &: 2(L+B) \\ &= 2[125+45] \\ &= 340 \text{ m} \end{aligned}$$

Ques: 7 A door of length 2.5m and breadth 1.5m is fitted in a wall. The length of wall is 9m and breadth is 6m. Find the cost of painting the wall, if the rate of painting the wall is ₹ 30 per m^2 .

Soln:- Length of wall = 9m
 breadth " = 6m
 $\therefore \text{Area} = 9 \times 6 = 54 \text{ m}^2$

Length of door = 2.5m
 breadth " = 1.5m
 Area of door $= 2.5 \times 1.5$
 $= 3.75 \text{ m}^2$

Now area of wall for painting $= 54 - 3.75$
 $= 50.25 \text{ m}^2$
 Cost of painting per $\text{m}^2 = 30 \text{ ₹}$
 $\therefore 50.25 \text{ m}^2 = 50.25 \times 30$
 $= 1507.50 \text{ ₹}$

Ques: 8 A door of dimension $3\text{m} \times 2\text{m}$ and a window of dimensions $2.5\text{m} \times 1.5\text{m}$ is fitted in a wall. The length of the wall is 7.8m and breadth is 3.9m . Find the cost of painting the wall, if the rate of painting the wall is ₹ 25 per m^2 .

Soln: Length of Door = 3m
 breadth = 2m
 area = $3 \times 2 = 6\text{m}^2$

Area of window
 = 2.5×1.5
 = 3.75m^2

Area of Wall = 7.8×3.9
 = 30.42m^2

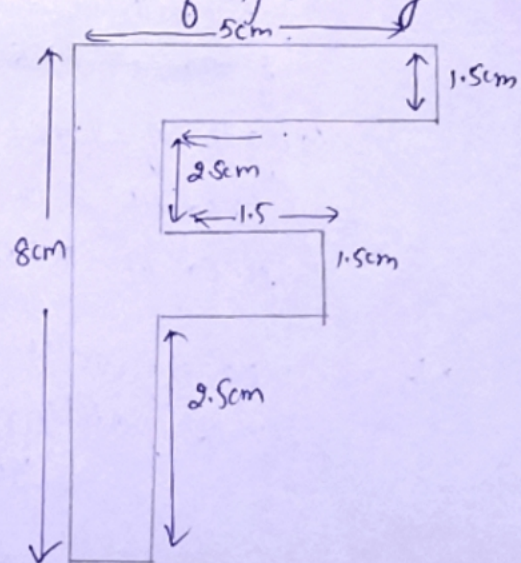
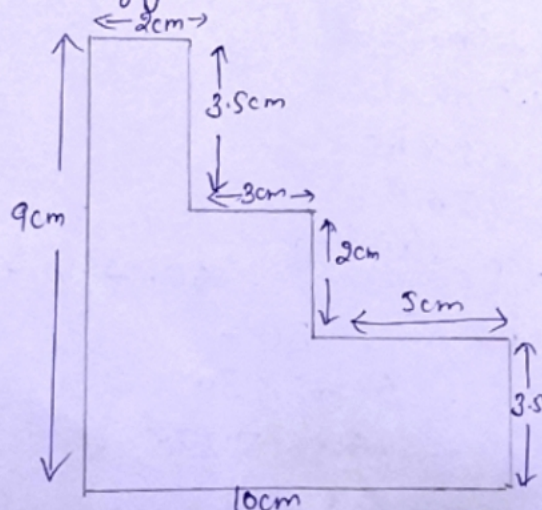
Now Area of Wall for painting

= $30.42 - (6 + 3.75)$
 = 20.67m^2

Cost of painting per m^2 = ₹ 25

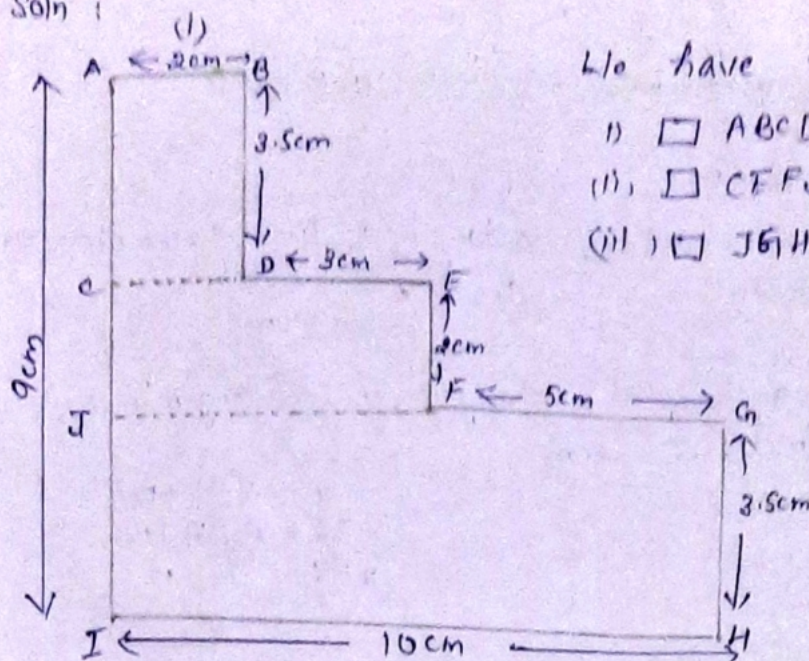
Cost " 20.67m^2 = 20.67×25
 = ₹ 516.75

Q: 9. Find the area and perimeter of following figures.



Soln :

(5)



We have three Rectangles

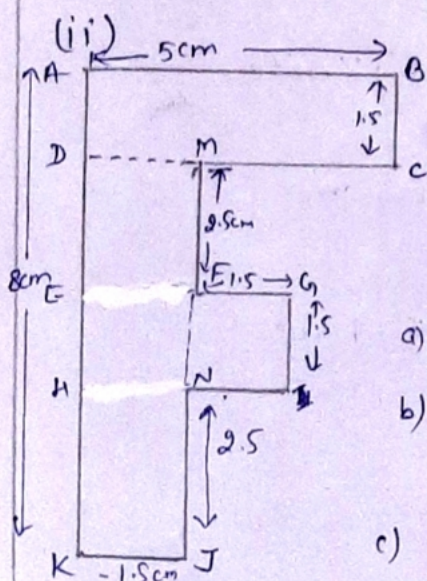
i) $\square ABCD$

ii) $\square CEFG$

iii) $\square JGHI$

(i) Perimeter : $AB + BC + CD + DE + EF + FG + GH + HI + IJ$
 $2 + 3.5 + 3 + 2 + 5 + 3.5 + 10 + 9$
 $= 38\text{cm}$

Area = $\text{area of } ABCD + \text{area } CEFG + \text{area } JGHI$
 $2 \times 3.5 + 5 \times 2 + 10 \times 3.5$
 $= 7 + 10 + 35$
 $= 52\text{ cm}^2$



Perimeter = $AB + BC + CD + DE + EF + FG + GH + HI + IJ + JK$
 $= 5 + 1.5 + 3.5 + 2.5 + 1.5 + 1.5 + 1.5 + 2.5 + 1.5 + 8$
 $= 29\text{cm}$

a) Area of Rectangle ABCD $L = 5\text{cm}$ $B = 1.5$
 $= 7.5\text{cm}^2$

b) Rectangle DMKJ. Length = $DK = 6.5$
 $B = KJ = 1.5$

c) Rectangle FGNI
 $GF = 1.5$ $GI = 1.5$
 $\text{Area} = 1.5 \times 1.5 = 2.25\text{cm}^2$

So total area of given figure is

$$7.5 + 9.75 + 2.25 = 19.5 \text{ cm}^2$$

Ques: 10 (c) MCQ

What is the area of rectangle of dimensions $12\text{cm} \times 10\text{cm}$?

Ans: (b) 120cm^2

Soln: $A = 12 \times 10$
 $= 120\text{cm}^2$

(ii) Find the breadth of a rectangle whose length is 12cm and Perimeter is 36cm

Ans: (a) 6cm

Soln: $P = 2(L+B)$

$$36 = 2(12+B)$$

$$18 = 12+B$$

$$18-12 = B$$

$$B = 6\text{cm}$$

(iii) If each side of square is 1m then area is?

Ans: (d) 10000cm^2

Soln: $1\text{m} = 100\text{cm}$

$$\text{area of square} = 100 \times 100$$
$$= 10000\text{cm}^2$$

(iv) Find the area of square whose perimeter is 96cm .

Ans: (a) 576cm^2

Soln: Perimeter of square = $4 \times \text{side}$

$$4 \times \text{side} = 96$$

$$\text{side} = \frac{96}{4} = 24\text{cm}$$

$$\text{Area} = \text{side} \times \text{side}$$

$$24 \times 24 = 576\text{cm}^2$$

(V) The area of rectangular sheet is 500cm^2 . If the length of sheet is 25cm , what is the breadth?

Ans : (C) 20cm

Soln.

$$A = L \times B$$

$$500 = 25 \times B$$

$$B = \frac{500}{25} = 20\text{cm}$$

(vi) What happened to the area of square, if its side is doubled?

Ans : (a) The area becomes 4 times, the original square.

Soln.

Let the side be = $a\text{cm}$

$$\text{area} = a^2$$

If it get doubled = $2a$

$$\text{Now area} = 2a \times 2a$$

$$= 4a^2$$

i.e four times the previous one.

8

Exercise : 11.2

Ques : I Estimate the area of following figures by counting the square units.

Soln. : (i) Area of 1 square = 1 sq. unit.

No. of squares covered completely = 119

No. of squares covered ^{more than} half = 6

" less than half = 4 = 0

Estimated area = $119 + 6 + 0 = 125$ square units

(ii) No. of squares covered completely = 96

" " half covered = 6 = $6 \times 1 = 6$

" " more than half = 4 = 0

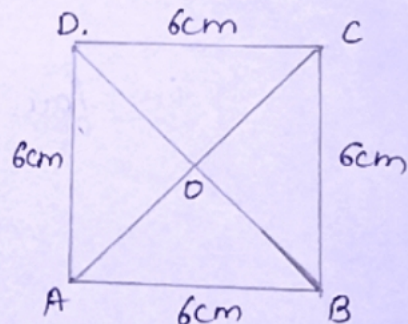
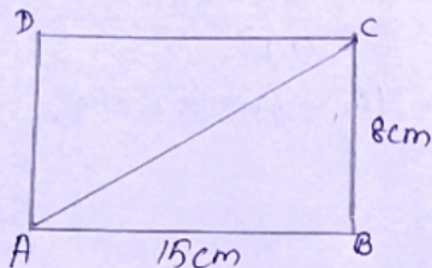
= less than half covered = 4 = 0

Total area = $96 + 6 + 0 = 102$ square units.

Ques 2 In the following find the area of

(i) $\triangle ABC$

(ii) $\triangle COD$



Soln : (i) Length of Rect. = 15cm

breadth = 8cm

diagonal AC divide the rectangle into two equal triangles.

So area of $\triangle ABC = \frac{1}{2} \times \text{area of Rect.}$

$$= \frac{1}{2} \times 15 \times 8$$

$$= 60 \text{ cm}^2$$

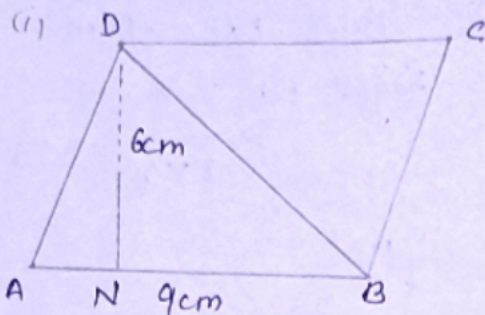
(ii) two diagonals divide the square into four triangles

So. area of each triangle

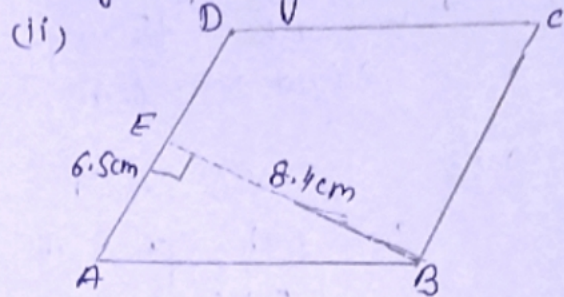
$$= \frac{1}{4} \times \text{area of square}$$

$$= \frac{1}{4} \times 6 \times 6 = 9 \text{ cm}^2$$

Ques: 3. Find the area of following parallelograms. (9)

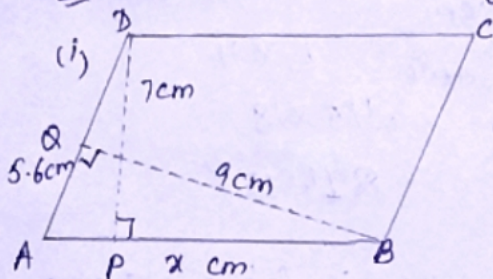


Soln: (i) Base of parallelogram = 9cm
 Height " = 6cm
 Area = Base $\times$ Height
 = 9×6
 = 54 cm^2

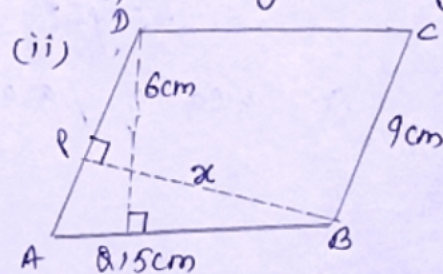


(ii) Base of parallelogram = 6.5cm
 Height = 8.4cm
 Area = $B \times H$
 = 6.5×8.4
 = 54.6 cm^2

Ques: 4. Find the value of x in the following parallelograms.



Soln: (i), In $\square ABCD$.
 If base is $x \text{ cm}$ then
 we take height $DP = 7 \text{ cm}$
 and $\parallel$ If AD is base
 the height is $BQ = 9 \text{ cm}$



So area of $\square ABCD = B \times H$
 $\therefore (x \times 7) \text{ cm}^2$ — (1)
 and area $\square ABCD$ taking
 AD as base = $(5.6 \times 9) \text{ cm}^2$ — (2)

$$\Rightarrow x \times 7 = 5.6 \times 9$$

$$x = \frac{5.6 \times 9}{7} = 7.2 \text{ cm}$$

$$x = 7.2 \text{ cm}$$

(11) In parallelogram ABCD

Base AB = 15cm

Height DQ = 6cm

$$\text{Area} = 15 \times 6 \quad \text{--- (1)}$$

So both eqn will be equal

$$15 \times 6 = 9 \times x$$

$$x = \frac{15 \times 6}{9}$$

$$x = 10 \text{ cm}$$

(10)

Base AD = 9cm

Height BP = x cm

$$\text{Area} = 9 \times x \quad \text{--- (2)}$$

Q15 The adjacent sides of parallelogram are 28cm and 45cm and the altitude on longer side is 18cm. Find the area of parallelogram.

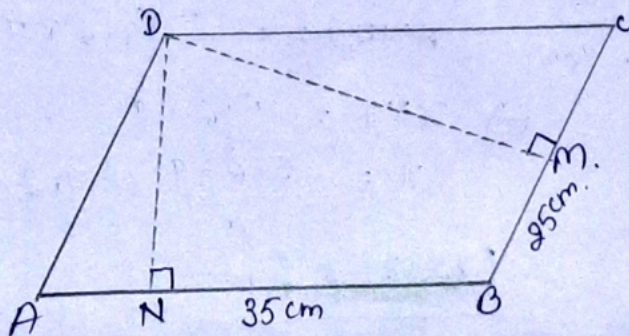
Ans:- Altitude is on longer side i.e. Base = 45cm
Height = 18cm

$$\text{So area of parallelogram} = B \times H$$

$$= 45 \times 18$$

$$= 810 \text{ cm}^2$$

Q16 ABCD is a parallelogram given in figure. DN and DM are the altitudes on side AB and CB. If area of parallelogram is 1225 cm^2 , AB = 35cm and CB = 25cm find DN and DM.



(11)

Soln :- Area of Parallelogram ABCD = 1225 cm^2

(i) Taking AB as Base and DN as height

$$AB \times DN = 1225$$

$$35 \times DN = 1225$$

$$DN = \frac{1225}{35} = 35 \text{ cm}$$

(ii) Taking BC as Base and DM as height

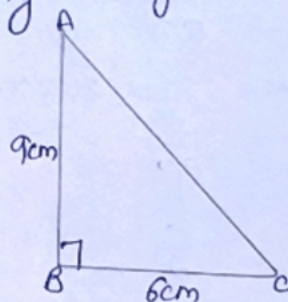
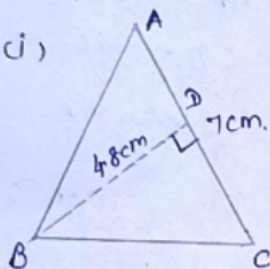
$$BC \times DM = 1225$$

$$25 \times DM = 1225$$

$$DM = \frac{1225}{25} = 49 \text{ cm}$$

Ques: 7 Find the area of following triangles

(i)



Soln (i) Area of triangle

$$= \frac{1}{2} \times \text{Base} \times \text{height}$$

$$\text{area of } \triangle ABC = \frac{1}{2} \times AC \times BD$$

$$= \frac{1}{2} \times 7 \times 4.8$$

$$= 16.8 \text{ cm}^2$$

(ii) Base = 6 cm

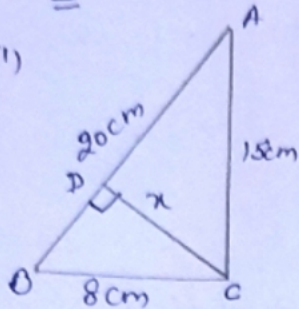
height = 9 cm

$$\text{area of } \triangle ABC = \frac{1}{2} \times 6 \times 9$$

$$= 27 \text{ cm}^2$$

Ques:- 8 Find the value of x in following Triangles.

(i)



Soln. (i) In $\triangle ABC$

Base $BC = 8 \text{ cm}$

Height $AB = 15 \text{ cm}$

$$\text{Area} = \frac{1}{2} \times 8 \times 15 \quad \text{--- (1)}$$

and if we take base

$AB = 20 \text{ cm}$

Height $BD = x \text{ cm}$

$$\text{then Area} = \frac{1}{2} \times 20 \times x \quad \text{--- (2)}$$

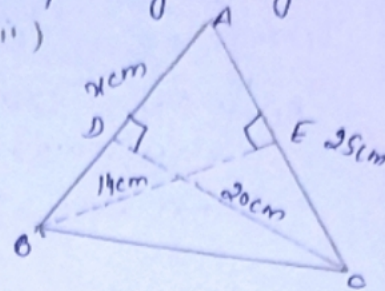
$$\text{eqn (1)} = \text{eqn (2)}$$

$$\frac{1}{2} \times 8 \times 15 = \frac{1}{2} \times 20 \times x$$

$$\frac{15 \times 4}{10} = x$$

$$x = 6 \text{ cm}$$

(ii)



(i) In $\triangle ABC$

Base $AC = 25 \text{ cm}$

Height $BE = 14 \text{ cm}$

$$\text{area} = \frac{1}{2} \times 25 \times 14 \quad \text{--- (1)}$$

In $\triangle ABC$

Base $AB = x \text{ cm}$

Height $CD = 20 \text{ cm}$

$$\text{area} = \frac{1}{2} \times 20 \times x \quad \text{--- (2)}$$

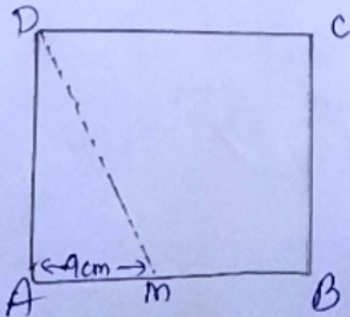
$$\text{Now eqn (1)} = \text{eqn (2)}$$

$$\frac{1}{2} \times 25 \times 14 = \frac{1}{2} \times 20 \times x$$

$$10x = 175 \text{ cm}$$

$$x = \frac{175}{10} = 17.5 \text{ cm}$$

Ques: 9 ABCD is a square, M is a point on AB such that $AM = 9 \text{ cm}$ and area of $\triangle DAM$ is 171 cm^2 . What is the area of square?



Soln:-

Since $\triangle ADM$ is a triangle with base AM and height AD

$$\text{area} = \frac{1}{2} \times AM \times AD$$

$$171 = \frac{1}{2} \times 9 \times AD$$

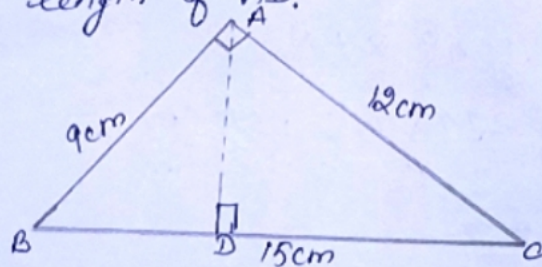
$$AD = \frac{171 \times 2}{9} = 38 \text{ cm.}$$

$$\Rightarrow \text{Side of square} = 38 \text{ cm}$$

$$\text{area} = \text{side} \times \text{side}$$

$$= 38 \times 38 = 1444 \text{ cm}^2.$$

Q10 $\triangle ABC$ is a right angled at A as shown in figure. AD is perpendicular to BC , if $AB = 9 \text{ cm}$, $BC = 15 \text{ cm}$ and $AC = 12 \text{ cm}$. Find the area of $\triangle ABC$, Also find the length of AD .



Soln:- Since $\triangle ABC$ is right angled triangle

$$\text{area} = \frac{1}{2} \times AB \times AC$$

$$= \frac{1}{2} \times 9 \times 12 = 54 \text{ cm}^2.$$

Now taking BC as base and AD as height

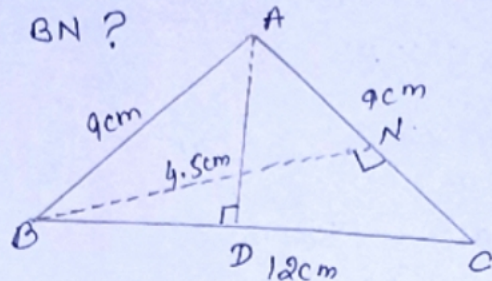
$$\text{area} = \frac{1}{2} \times BC \times AD$$

$$54 = \frac{1}{2} \times 15 \times AD$$

$$AD = \frac{54 \times 2}{15} = \frac{36}{5} = 7.2 \text{ cm.}$$

$$\boxed{AD = 7.2 \text{ cm}}$$

Ques:-11 $\triangle ABC$ is isosceles with $AB = AC = 9\text{cm}$ $BC = 12\text{cm}$ and height AD from A to BC is 4.5cm . Find the area of $\triangle ABC$. What will be the height from B to AC i.e. BN ?



Soln.

In $\triangle ABC$

Base $BC = 12\text{cm}$

height $AD = 4.5\text{cm}$

$$\text{area} = \frac{1}{2} \times 12 \times 4.5 = 27\text{cm}^2$$

Now taking AC as base and BN as height

$$\text{area} = \frac{1}{2} \times AC \times BN$$

$$27 = \frac{1}{2} \times 9 \times BN$$

$$BN = \frac{27 \times 2}{9} = 6\text{cm}$$

$$\boxed{BN = 6\text{cm}}$$

Ques 12 MCQ
(i) Find the height of 11m whose area is 246cm^2 and base is 20cm .

Ans :- C (12.3cm^2)

Soln: $A = \text{Base} \times \text{height}$

$$246 = 20 \times h$$

$$h = \frac{246}{20} = 12.3$$

(ii) One of the side and height of 11m are 7cm and 3.5cm . Find the Area of 11m .

Ans. b (24.5cm^2)

Soln. $\text{Area} = 7 \times 3.5 = 24.5\text{cm}^2$

Q (iii) The height of triangle whose base is 13cm and area is 65cm^2 is

Soln: C (10cm)

Soln: $A = \frac{1}{2} \times B \times h$

$$65 = \frac{1}{2} \times 13 \times h$$

$$h = \frac{65 \times 2}{13} = 10\text{cm}$$

(iv) Find the area of isosceles right angled triangle whose equal sides are of length 40cm each

Ans:- (d) (800cm^2)

Soln: $\frac{1}{2} \times 40 \times 40$
 $= 800\text{cm}^2$

(v) If the sides of a parallelogram are increased to twice of its original length, how much will be the perimeter of the new fig.

Ans: (B) (2 times)

(vi) In a right angled triangle one leg is doubled and the other and area is 64cm^2 find the smaller leg.

Ans. (a) (8cm)

Let one leg = $x\text{cm}$
 another = $2x$

$$64 = \frac{1}{2} \times x \times 2x$$

$$x^2 = 64$$

$$x = \pm 8$$

So length of smaller leg = 8cm.

Exercise 11.3

(16)

Ques: 1 Find the circumference of circle whose:

- (i) radius = 21cm (ii) Radius = 3.5cm (iii) Diameter = 84cm

Soln :- Circumference of circle = $2\pi r$

$$(i) \quad C = 2 \times \frac{22}{7} \times 21^3$$

$$= 3 \times 22 \times 2 = 132 \text{ cm}$$

$$(ii) \quad C = 2 \times \frac{22}{7} \times 3.5^{\cdot 5}$$

$$= 2 \times 22 \times \frac{8}{10} = 22 \text{ cm}$$

$$(iii) \quad C = 2 \times \frac{22}{7} \times \frac{84}{2} = 264 \text{ cm}$$

$$r = \frac{84}{2} = 42$$

Ques: 2 If the circumference of a circular sheet is 176m find its radius.

Soln :- Circumference (C) = $2\pi r$

$$2 \times \frac{22}{7} \times r = 176$$

$$r = \frac{176 \times 7}{2 \times 22} = 28 \text{ cm}$$

$$r = 28 \text{ cm}$$

Ques: 3 A circular disc of diameter 8.4cm is divided into two parts what is the perimeter of each semicircular part?

Soln :- Diameter = 8.4cm

$$\text{radius} = \frac{8.4}{2} = 4.2 \text{ cm}$$

$$\text{Circumference of semicircle} = \frac{1}{2} \times 2 \times \frac{22}{7} \times 4.2 = 13.2 \text{ cm}$$

$$\text{Perimeter of semi circular disc} = 13.2 \text{ cm} + 8.4$$

$$= 21.6 \text{ cm}$$

Ques: 4 Find the area of the circle having

(i) Radius = 49 cm

(ii) $R = 2.8$ cm

(iii) Diameter = 4.2 cm

Soln:-

(i) Area of circle = πr^2

$$A = \frac{22}{7} \times 49 \times 49$$

$$= 22 \times 7 \times 49 = 7546 \text{ cm}^2$$

(ii) Area of circle = $\frac{22}{7} \times 2.8 \times 2.8$

$$= 22 \times \frac{4}{10} \times \frac{28}{10} = 24.64 \text{ cm}^2$$

(iii) Diameter = $\frac{4.2}{2} = 2.1$ cm

$$\text{Area} = \frac{22}{7} \times 2.1 \times 2.1$$

$$= 22 \times \frac{3}{10} \times \frac{21}{10} = 13.86 \text{ cm}^2$$

Ques: 5 A gardener wants to fence a circular garden of radius 15 m. Find the length of wire, if he make three rounds of fence. Also, find the cost of wire if it cost ₹ 5 per meter.

Soln:- Circumference of circular garden = $2\pi r$
 $r = 15$ m

$$C = 2 \times \frac{22}{7} \times 15 = \left(\frac{44 \times 15}{7} \right) \text{ m}$$

Length of wire in three rounds = $\left(\frac{44 \times 15}{7} \times 3 \right) \text{ m}$

$$= \frac{1980}{7} = 282.85 \text{ m}$$

Cost of wire 1 m = ₹ 5

$$\text{Cost of } 282.85 \text{ m} = 282.85 \times 5$$

$$= 1414.28 \text{ ₹}$$

(16)

Qus 6 Which of the following has larger area and by how much?

- (i) Rectangle of length 15cm and breadth 5.4cm
- (ii) circle of diameter 5.6cm.

Soln :- Area of rectangle = $L \times B$
 $= 15 \times 5.4$
 $= 81 \text{ cm}^2$

area of circle = πr^2
 $r = \frac{5.6}{2} = 2.8 \text{ cm}$
 $= \frac{22}{7} \times 2.8 \times 2.8$
 $= 22 \times \frac{4}{10} \times \frac{28}{10} = 24.64 \text{ cm}^2$

Hence Rectangle has more area and by 56.36 cm^2

Qus 7 From a rectangular sheet of length 15cm and breadth 12cm a circle of radius 3.5cm is removed. Find the area of remaining sheet.

Soln. Area of rectangular sheet = 15×12
 $= 180 \text{ cm}^2$

Area of circle = πr^2
 $= \frac{22}{7} \times 3.5 \times 3.5$
 $= \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2}$

$= \frac{11 \times 35}{10} = 38.5 \text{ cm}^2$

Area of Remaining sheet = Area of Rectangle - Area of circle
 $180 - 38.5$
 $= 141.5 \text{ cm}^2$

Qus: 8 From a circular sheet of radius 7cm, a circle of radius 2.1cm is removed. Find the area of remaining sheet. (19)

Soln:

Radius of circle = 7cm

$$\text{Area} = \frac{22}{7} \times 7 \times 7 = 154 \text{ cm}^2$$

Now Radius of smaller circle = $\frac{22}{7} \times \frac{21}{10} \times \frac{21}{10}$

$$A = \frac{22 \times 63}{100} = 13.86$$

$$\text{Area of remaining sheet} = 154 - 13.86 = 140.14 \text{ cm}^2$$

Qus: 9 Smeep took a wire of length 88cm and bent it into the shape of circle, find the radius and area of circle. If the same wire is bent into into a square, What will be the side of the square? Which figure encloses more area?

Soln: a) length of wire = Circumference of circle.

$$2\pi r = 88$$

$$\frac{2 \times 22}{7} \times r = 88$$

$$r = \frac{88 \times 7}{2 \times 22} = 14 \text{ cm}$$

$$\text{Area of circle} = \frac{22}{7} \times 14 \times 14 = 28 \times 22 = 616 \text{ cm}^2$$

b) Length of wire = Perimeter of square

$$88 = 4 \times S$$

$$S = \frac{88}{4} = 22 \text{ cm}$$

$$\text{Area of square} = 22 \times 22 = 484 \text{ cm}^2$$

Therefore Circle encloses more area than square.

Q10 = A garden is 120m long and 85m broad. Inside the ^{so} garden there is a circular pit of diameter 14m. Find the cost of planting the remaining part of the garden at the rate of 5.50 ₹ per square meter.

Soln: Garden is in the shape of rectangle
So area of garden = $120 \times 85 = 10,200 \text{ m}^2$

$$\text{Area of circular pit} = \pi r^2$$

$$r = \frac{14}{2} = 7 \text{ m}$$

$$\text{Remaining Area} = \frac{22}{7} \times 7 \times 7 = 154 \text{ m}^2$$

$$\text{Now Area for Planting} = 10200 - 154 \\ = 10046 \text{ m}^2$$

$$\text{Cost of planting per m}^2 = ₹ 5.50$$

$$\text{Cost of " } 10046 \text{ m}^2 = 10046 \times 5.50 \\ = ₹ 55253.$$

Q11 In the figure $PQ = QR$ and $PR = 56 \text{ cm}$. The radius of inscribed circle is 7cm. Q is the centre of semi circle. What is the area of shaded region.

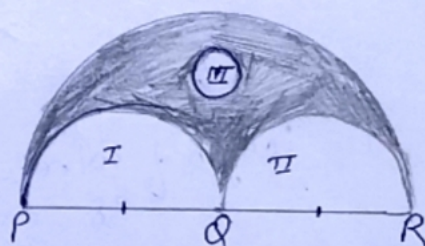
Soln :- 1) $PR = 56$
 $\therefore PQ = QR = \frac{56}{2} = 28 \text{ cm}$

$$\text{Area of Semicircle} = \frac{1}{2} \pi r^2$$

$$= \frac{1}{2} \times \frac{22}{7} \times 28 \times 28$$

$$= 11 \times 4 \times 28$$

$$= 1232 \text{ cm}^2.$$



Area of Semicircle I

$$r = \frac{28}{2} = 14$$

$$A = \frac{1}{2} \times \frac{22}{7} \times 14 \times 14$$

$$= 22 \times 14$$

$$= 308 \text{ cm}^2$$

Area of semicircle II = 308 cm^2

Area of circle III = πr^2 $r = 7 \text{ cm}$

$$= \frac{22}{7} \times 7 \times 7 = 154 \text{ cm}^2$$

Now Area of shaded part =

$$1232 - (308 + 308 + 154)$$

$$= 1232 - 770$$

$$= 462 \text{ cm}^2$$

Q12 The minute hand of a clock is 18 cm long. How far does the tip of minute hand move in one hour?

Soln : $r = 18 \text{ cm}$

Total distance covered = $2\pi r$

$$= 2 \times \frac{22}{7} \times 18 = \frac{44 \times 18}{7} = \frac{792}{7} = 113.04 \text{ cm}$$

Q13 mcd

(i) The circumference of circle of diameter 10 cm is

Ans. (a) 31.4 cm

Soln $C = 2 \times \frac{22}{7} \times 5 = 31.4$

(ii) The circumference of circle with radius 14 cm is

Ans. (a) 88 cm

Soln. $C = 2 \times \frac{22}{7} \times 14 = 88$

(iii) What is the area of circle of radius 7 cm

Ans. (c) 154 cm^2

Soln $A = \frac{22}{7} \times 7 \times 7 = 154 \text{ cm}^2$

(iv) Find the diameter of circle whose area is 154 cm^2

Ans. (c) 14 cm

Soln $\frac{22}{7} \times r^2 = 154$
 $r^2 = \frac{154 \times 7}{22}$
 $r = 7$

(v) A circle has area 100 times the another circle what is the ratio of their circumferences.

Ans. (a) $10:1$

(vi) Diameter of circular garden is 9.8 cm . Which of the following is its area?

Ans. (a) 75.46 cm^2

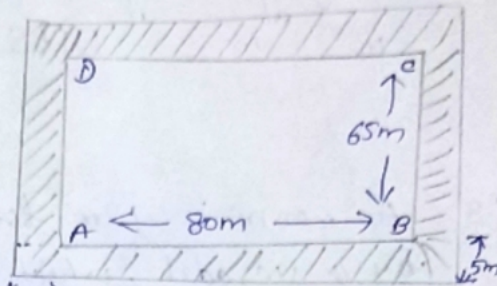
$A = \pi r^2$

Exercise 11.4

(22)

Ques 1 A Rectangular Park is 80m long and 65m wide. A path of 5m width is constructed outside the park. Find the area of path.

Soln:- Length of Park = 80m
Breadth of Park = 65m
Area of Park = 80×65
 $= 5200 \text{ m}^2$



Length of Park including path = $80 + 5 + 5 = 90 \text{ m}$

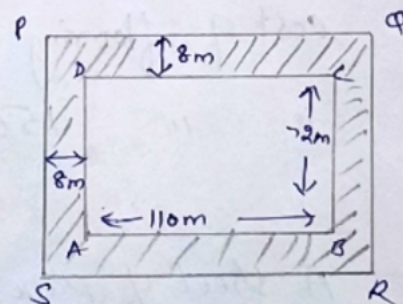
Breadth " " = $65 + 5 + 5 = 75 \text{ m}$

Now Area = $90 \times 75 = 6750 \text{ m}^2$

$\therefore$ Area of Path = $(6750 - 5200)$
 $= 1550 \text{ m}^2$

Q2 A rectangular garden is 110m long and 72m broad. A path of uniform width 8m has to be constructed around it. Find the cost of gravelling the path at ₹ 11.50 per m^2 .

Soln:- Length of garden = 110m
breadth = 72m
Area of garden ABCD = 110×72
 $= 7920 \text{ m}^2$



Length of garden including path = $110 + 8 + 8 = 126 \text{ m}$
breadth " " = $(72 + 8 + 8) = 88 \text{ m}$

Area PQRS = 126×88

$= 11088 \text{ m}^2$

$$\begin{aligned}\text{Now area of Path} &= \text{area of PQRS} - \text{area ABCD} \quad (13) \\ &= 11088 - 7920 \\ &= 3168 \text{ m}^2\end{aligned}$$

$$\begin{aligned}\text{Cost of gravelling the path per m}^2 &= ₹ 11.50 \\ \text{" " } 3168 \text{ m}^2 &= 11.50 \times 3168 \\ &= ₹ 36432\end{aligned}$$

Q3 A room is 12m long and 8m broad. It is surrounded by a verandah, which is 3m wide all around it. Find the cost of flooring the verandah with marble at ₹ 275 per m².

$$\begin{aligned}\text{Soln :- Length of room} &= 12 \text{ m} \\ \text{breadth " } &= 8 \text{ m} \\ \text{Area} &= 12 \times 8 = 96 \text{ m}^2\end{aligned}$$

$$\begin{aligned}\text{Length of room including verandah} &= 12 + 3 + 3 = 18 \text{ m} \\ \text{breadth " " } &= 8 + 3 + 3 = 14 \text{ m} \\ \text{Area} &= 18 \times 14 = 252 \text{ m}^2.\end{aligned}$$

$$\begin{aligned}\text{Now area left for flooring} &= (252 - 96) \\ &= 156 \text{ m}^2\end{aligned}$$

$$\begin{aligned}\text{Cost of flooring 1 m}^2 \text{ area} &= ₹ 275 \\ \text{" " } 156 \text{ m}^2 \text{ area} &= 275 \times 156 \\ &= ₹ 42900\end{aligned}$$

Q4 A sheet of paper measures 30cm x 24cm. A strip of 4cm width is cut from it all around. Find the area of remaining sheet and also area of cut out strip.

Soln Area of given sheet = 30×24
 $= 720 \text{ cm}^2$

Length of paper remained after cutting a piece of 4cm
 all round = $30 - (4+4)$
 $= 22 \text{ cm}$

breadth " " = $24 - (4+4)$
 $= 16 \text{ cm}$

Area = 22×16
 $= 352 \text{ cm}^2$

Area of paper strip cut out = $(720 - 352) = 368 \text{ cm}^2$

Ques: 5 A path of 2m wide is built along the border
 inside a square garden of side 40m. Find

(i) the area of path.

(ii) The cost of planting grass in the remaining portion
 of the garden at the rate of ₹ 50 per m^2 .

Soln:- Area of square garden = 40×40
 $= 1600 \text{ m}^2$

Area of square garden excluding path = $40 - (2+2)$
 $= 36$
 $= 36 \times 36 = 1296 \text{ m}^2$

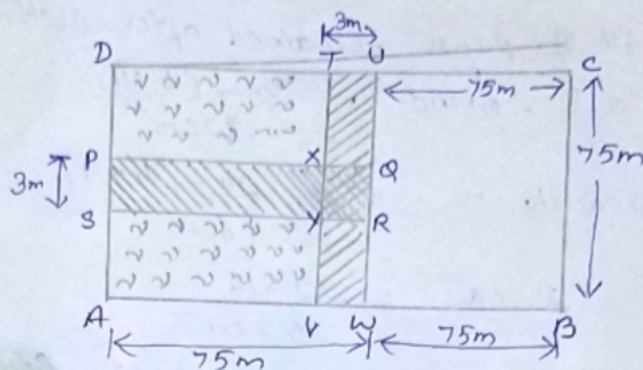
(i) The area of path = $(1600 - 1296)$
 $= 304 \text{ m}^2$

(ii) Cost of planting grass per $\text{m}^2 = ₹ 50$
 " " $1296 \text{ m}^2 = 1296 \times 50$
 $= ₹ 64800$

Ques 6 A nursery school playground is 150m long and 75m
 wide. A portion of $75\text{m} \times 75\text{m}$ is kept for see-saw
 slides and other park equipments. In the remaining
 portion 3m wide path parallel to its width and
 parallel to remaining length. The remaining

area is covered by grass. Find the area covered by grass. (25)

Soln ∴



$$\begin{aligned} \text{Area kept for sea-saw slides} &= 75 \times 75 \\ &= 5625 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} \text{Area of school ground} &= 150 \times 75 \\ &= 11250 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} \text{Area of path parallel to width of ground} &= 75 \times 3 \\ &= 225 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} \text{" " " length of ground} &= 75 \times 3 \\ &= 225 \text{ m}^2 \end{aligned}$$

$$\text{Area common to both paths} = 3 \times 3 = 9 \text{ m}^2$$

$$\begin{aligned} \text{Total area covered by path} &= (225 + 225 - 9) \\ &= 441 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} \text{Area covered by grass} &= \text{Area of ground} - (\text{Area under sea-saw} + \text{area covered by path}) \end{aligned}$$

$$= 11250 - (5625 + 441)$$

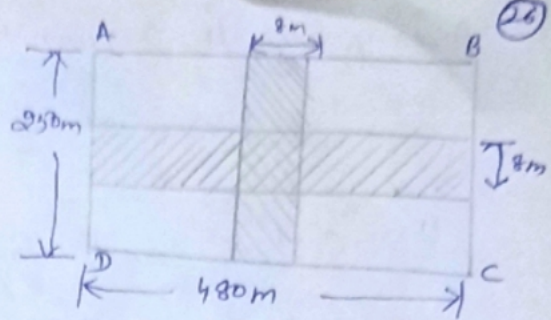
$$= 5184 \text{ m}^2$$

Q7

Two cross roads each of width 8m cut at right angle through the centre of a rectangular park of length 480m and breadth 250m and parallel to its sides. Find the area of roads. Also find the area of park excluding cross roads.

Sol'n. Area of park
 $ABCD = 480 \times 250$
 $= 120000 \text{ m}^2$

Area of path parallel to
length of park $= 480 \times 8$
 $= 3840 \text{ m}^2$



Area of path parallel to width of park $= 250 \times 8$
 $= 2000 \text{ m}^2$

Area common to both the paths $= 8 \times 8$
 $= 64 \text{ m}^2$

Area of roads $= (3840 + 2000 - 64)$
 $= 5776 \text{ m}^2$

Area of park excluding cross roads $= 120000 - 5776$
 $= 114224 \text{ m}^2$

Ques In a rectangular field of length 92m and breadth 70m, two roads are constructed which are parallel to the sides and cut each other at right angles through the centre of field. If the width of road is 4m find,

- The area covered by roads
- The cost of constructing the roads at the rate of ₹ 150 per m^2

Sol'n :- Area of road parallel to length of field
 $92 \times 4 = 368 \text{ m}^2$

Area of road " width " $= 70 \times 4$
 $= 280 \text{ m}^2$

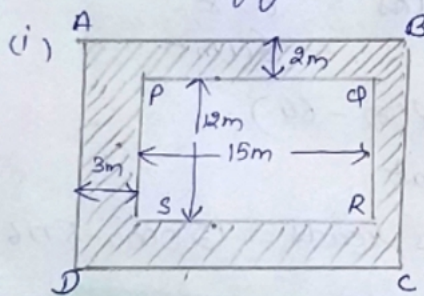
area is covered by grass. Find the area covered by (25)

Area of roads common to both the roads = 4×4
 $= 16 \text{ m}^2$ (27)

(i) The area covered by roads = $(368 + 280 - 16)$
 $= 632 \text{ m}^2$

(ii) Cost of constructing the roads at the rate of ₹ 150 per m^2 = 632×150
 $= ₹ 94800$

Q9 Find the area of shaded region in the following figures.



Sol: (i) Area of Rectangle PQRS
 $15 \times 12 = 180 \text{ m}^2$

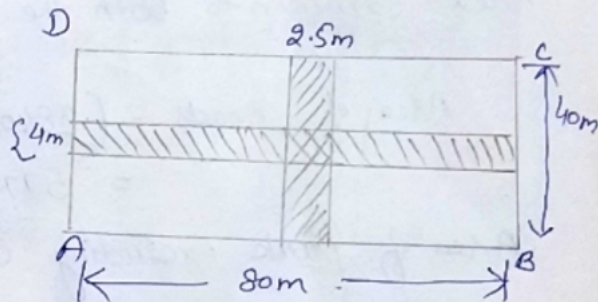
Length of Rectangle ABCD

$15 + 3 + 3 = 21 \text{ m}$

breadth " = $12 + 2 + 2 = 16 \text{ m}$

Area of ABCD = 21×16
 $= 336 \text{ m}^2$

Area of remaining shaded portion = $336 - 180$
 $= 156 \text{ m}^2$



(i) Area of path parallel to length = $80 \times 4 = 320 \text{ m}^2$

Area of path parallel to width
 40×2.5
 $= 100 \text{ m}^2$

Area common to both paths
 $4 \times 2.5 = 10 \text{ m}^2$

Area of shaded portion
 $(320 + 100 - 10)$
 $= 410 \text{ m}^2$