

CHAPTER-11 PERIMETER AND AREA

EX.11.1

1.  $l=500m$      $b=300m$   
 i)  $\text{Area}=l \times b = 500 \times 300 = 150000m^2$   
 ii) Cost for  $1m^2=10,000$  Rs  
 $\therefore 150000m^2=150000 \times 10,000$   
 $=150,00,00,000$  Rs
2. Perimeter of square = 320m  
 $4a=320$   
 $a=\frac{320}{4}=80$   
 $\text{Area}=a^2=80 \times 80=6400m^2$
3. Area of Rectangle=440m<sup>2</sup>  
 $l=22m$   
 $b=?$   
 $l \times b = 440$   
 $b=\frac{440}{22}$   
 $b=20m$   
 Perimeter=2(l+b)  
 $=2(22+20)$   
 $=2(42)=84m^2$
4. Perimeter of rectangular=100cm  
 $l=35cm$   
 $b=?$   
 $2(l+b) = 100$   
 $2(35+b)=100$   
 $35+b=50$   
 $b=15cm$   
 $\text{Area}=l \times b = 35 \times 15 = 525cm^2$
5. Area of square=Area of rectangle  
 $a^2=l \times b$   
 $60 \times 60=90 \times b$   
 $\frac{3600}{90} = b$   
 $40m=b$
6.  $l=40cm$      $b=22cm$   
 Perimeter of Rectangle=2(l+b)  
 $=2(62)$   
 $=124cm$   
 Perimeter of Square=124cm  
 $4a=124$   
 $a=\frac{124}{4}=31cm$   
 Area of Rectangle =  $l \times b$

$$= 40 \times 22$$

$$= 880 \text{ cm}^2$$

Area of Square =  $31 \times 31=961 \text{ cm}^2$   
 Square encloses more area than Rectangle.

7. Perimeter of Rectangle=130 cm  
 $b=30cm$   
 $l=?$   
 $2(l+b) = 130$   
 $l+30 = 65$   
 $\Rightarrow l = 35cm$

$$\text{Area}=l \times b$$

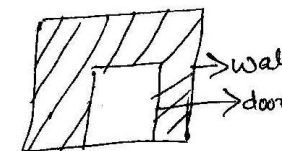
$$=35 \times 30$$

$$=1050 \text{ cm}^2$$

8. Door:  $l=2m$ ,  $b=1m$   
 Area of door =  $l \times b$   
 $=2m^2$

Wall:  $l=4.5m$   $b=3.6m$   
 Area of wall= $4.5 \times 3.6$   
 $=16.2m^2$

Area of shaded part is  
 Area of wall - Area of door  
 $16.2m^2 - 2m^2$   
 $=14.2m^2$



Cost of White Wash:  
 Rs: 20 per m<sup>2</sup>  
 $\therefore$  For  $14.2m^2=14.2 \times 20$   
 $=284$  Rs

Ex-11.2

1. a) Area of Parallelogram=base  $\times$  height= $7 \times 4=28 \text{ cm}^2$   
 b) Area of Parallelogram= base  $\times$  height =  $5 \times 3=15 \text{ cm}^2$   
 c) Area of Parallelogram= base  $\times$  height= $2.5 \times 3.5$

$$\begin{array}{r} 125 \\ \hline 75 \times \\ \hline 8.75 \text{ cm}^2 \end{array}$$

- d) Area of Parallelogram= base  $\times$  height= $5 \times 4.8=24.0 \text{ cm}^2$   
 e) Area of Parallelogram= base  $\times$  height= $2.4 \times 3.6=8.64 \text{ cm}^2$

2. a) Area of Triangle= $\frac{1}{2} \times \text{base} \times \text{height}$   
 $=\frac{1}{2} \times 4 \times 3 = \frac{12}{2} = 6 \text{ cm}^2$

- b) Area of Triangle= $\frac{1}{2} \times \text{base} \times \text{height}=\frac{1}{2} \times 5 \times 3.2 = 8.0 \text{ cm}^2$   
 c) Area of Triangle= $\frac{1}{2} \times \text{base} \times \text{height}=\frac{1}{2} \times 3 \times 4 = 6 \text{ cm}^2$

$$d) \text{ Area of Triangle} = \frac{1}{2} \times \text{base} \times \text{height} = \frac{1}{2} \times 3 \times 2 = 3 \text{ cm}^2$$

$$3. a) \text{ Area of Parallelogram} = b \times h$$

$$246 = 20 \times h$$

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

$$h = 12.3 \text{ cm}$$

$$b) \text{ Area of Parallelogram} = b \times h$$

$$154.5 = b \times 15$$

$$\frac{154.5}{15} = b$$

$$\therefore b = 10.3 \text{ cm}$$

$$c) \text{ Area of Parallelogram} = b \times h$$

$$48.72 = b \times 8.4$$

$$\frac{48.72}{8.4} = b$$

$$5.8 = b$$

$$\therefore b = 5.8 \text{ cm}$$

$$d) \text{ Area of Parallelogram} = b \times h$$

$$16.38 = 15.6 \times h$$

$$\frac{16.38}{15.6} = h$$

$$h = 1.05 \text{ cm}$$

$$4. a) \text{ Area of Triangle} = \frac{1}{2} \times b \times h$$

$$87 = \frac{1}{2} \times b \times 15$$

$$87 \times 2 = 15b$$

$$\frac{87 \times 2}{15} = b$$

$$\frac{174}{15} = b$$

$$b = 11.6 \text{ cm}$$

$$b) \text{ Area of Triangle} = \frac{1}{2} \times b \times h$$

$$1256 = \frac{1}{2} \times b \times 31.4$$

$$1256 \times 2 = 31.4b$$

$$\frac{1256 \times 2}{31.4} = b$$

$$\frac{2512}{31.4} = b$$

$$b = 80 \text{ mm}$$

$$c) \text{ Area of Triangle} = \frac{1}{2} \times b \times h$$

$$170.5 = \frac{1}{2} \times 22 \times h$$

$$170.5 \times 2 = 22h$$

$$\frac{170.5 \times 2}{22} = h$$

$$\frac{341}{22} = h$$

$$\therefore h = 15.5 \text{ cm}$$

$$5. a) \text{ Area of Parallelogram} = b \times h$$

$$= SR \times QM$$

$$= 12 \times 7.6$$

$$\text{Area of Parallelogram} = 91.2 \text{ cm}^2$$

$$b) \text{ Area of Parallelogram} = b \times h$$

$$= PS \times QN$$

$$91.2 = 8 \times QN$$

$$\frac{91.2}{8} = QN \Rightarrow 11.4 \text{ cm}$$

$$6. \text{ Area of Parallelogram} = b \times h$$

$$1470 = AB \times DL$$

$$1470 = 35 \times DL$$

$$\frac{1470}{35} = DL$$

$$\therefore DL = 42 \text{ cm}$$

$$\text{Area of Parallelogram} = b \times h$$

$$1470 = AD \times BM$$

$$1470 = 49 \times BM$$

$$\frac{1470}{49} = BM$$

$$\therefore BM = 30 \text{ cm}$$

$$7. \text{ Area of Triangle} = \frac{1}{2} \times b \times h$$

$$= \frac{1}{2} \times 5 \times 12 = \frac{60}{2} = 30 \text{ cm}^2$$

$$= 30 \text{ cm}^2$$

To find the length of AD

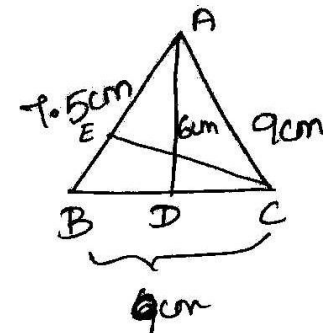
$$\text{Area of Triangle} = \frac{1}{2} \times b \times h$$

$$30 = \frac{1}{2} \times 13 \times AD$$

$$60 = 13AD$$

$$\therefore AD = \frac{60}{13} \text{ cm}$$

8.



$$\text{Area of Triangle} = \frac{1}{2} \times b \times h$$

$$= \frac{1}{2} \times 6 \times 9 = 27 \text{ cm}^2$$

To find height from C to AB

$$\text{Area of Triangle} = \frac{1}{2} \times b \times h$$

$$27 = \frac{1}{2} \times 7.5 \times CE$$

$$54 = 7.5CE$$

$$CE = \frac{54}{7.5} = 7.2 \text{ cm}$$

$$\therefore CE = 7.2 \text{ cm}$$

### EX-11.3

1. Circumference of the Circle =  $2\pi r$

a)  $r = 14 \text{ cm}$

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

b)  $28 \text{ mm}$

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

$$= 176 \text{ mm}$$

c)  $21 \text{ cm}$

$$= 2 \times \frac{22}{7} \times 21$$

$$= 132 \text{ cm}$$

2. Area of Circle  $\pi r^2$

a)  $r = 14 \text{ mm}$

$$= \frac{22}{7} \times 14 \times 14$$

$$= 44 \times 14$$

$$= 616 \text{ mm}^2$$

b)  $d = 49 \text{ m}$

$$r = \frac{49}{2} \text{ cm}$$

$$= \frac{22}{7} \times \frac{49}{2} \times \frac{49}{2}$$

$$= 77 \times \frac{49}{2} = 1886.5 \text{ m}^2$$

c)  $r = 5 \text{ cm}$

$$= \frac{22}{7} \times 5 \times 5 = 78.57 \text{ cm}^2$$

$$\text{(or)} 3.14 \times 5 \times 5 = 78.5 \text{ cm}^2$$

3. Circumference =  $154 \text{ m}$

$$2\pi r = 154$$

$$r = 154 \times \frac{1}{2} \times \frac{7}{22}$$

$$r = \frac{49}{2} \text{ m}$$

$$\text{Area} = \pi r^2 = \frac{22}{7} \times \frac{49}{2} \times \frac{49}{2}$$

$$= \frac{77 \times 49}{2}$$

$$= \frac{3773}{2} \text{ m}^2$$

$$= 1886.5 \text{ m}^2$$

$$4. d = 21 \text{ m} \Rightarrow r = \frac{21}{2} \text{ m}$$

Fence = Circumference

$$2\pi r = 2 \times \frac{22}{7} \times \frac{21}{2} = 66 \text{ m}$$

For 2 rounds =  $2 \times 66$

$$= 132 \text{ m}$$

Cost:

Rs. 4 per m

For 132 m =  $132 \times 4$

$$= \text{Rs. } 528$$

5. Circular Sheet

$r = 4 \text{ cm}$

$$\text{Area } \pi r^2 = \frac{22}{7} \times 4 \times 4$$

$$= \frac{352}{7} = 50.24 \text{ cm}^2$$

Circle  $r = 3 \text{ cm}$

$$\frac{22}{7} \times 3 \times 3 = \frac{198}{7} \text{ cm}^2 = 28.26$$

$$\text{Remaining Sheet} = \frac{352}{7} - \frac{198}{7} = \frac{154}{7} = 22 \text{ cm}^2$$

$$\text{(or)} 50.24 - 28.26 = 21.98 \text{ cm}^2$$

6. Diameter of Circular table cover =  $1.5 \text{ m}$

$$r = \frac{1.5}{2} \text{ m}$$

Perimeter =  $2\pi r$

$$= 2 \times \frac{22}{7} \times \frac{1.5}{2}$$

$$= 2 \times 3.14 \times \frac{1.5}{2}$$

$$= 3.14 \times 1.5$$

$$= 4.71 \text{ m}$$

Required lace length =  $4.71 \text{ m}$

cost  $\Rightarrow$  Rs. 15/m

For 4.71 m =  $15 \times 4.71 = 70.65 \text{ Rs.}$

7.  $d = 10 \text{ cm}$

$r = 5 \text{ cm}$

Perimeter of full circle =  $2\pi r$

$$\therefore \text{Perimeter of semi circle} = \frac{2\pi r}{2} = \pi r$$

$$= 3.14 \times 5$$

$$= 15.70 \text{ cm}$$

Perimeter of the given Shape =  $d +$  Perimeter of Semi circle

$$= (5 + 15.7) \text{ cm} = 20.7 \text{ cm}$$

8.  $d=1.6$  m

$$r = \frac{1.6}{2} \text{ m}$$

Area of top =  $\pi r^2$

$$= 3.14 \times 0.8 \times 0.8$$

$$= 2.0096 \text{ m}^2$$

Polishing: Rs 15/m<sup>2</sup>

$\therefore$  For 2.0096 m<sup>2</sup>

$$= 2.0096 \times 15$$

$$= \text{Rs } 30.144$$

9. Length of the wire = Circumference of the circle

$$44 = 2\pi r$$

$$\frac{44 \times 7}{2 \times 22} = r$$

$$7 = r$$

$$r = 7 \text{ cm}$$

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

Perimeter of square = Length of the wire

$$4a = 44$$

$$a = 11 \text{ cm}$$

$$\text{Area} = 11 \times 11 = 121 \text{ cm}^2$$

$\therefore$  Area of circle encloses more the square.

10. Circle:  $r=14$  cm

$$\text{Area} = \frac{22}{7} \times 14 \times 14$$

$$= 616 \text{ cm}^2$$

Two small circles:

$$r = 3.5 \text{ cm}$$

$$\text{Area of 2 circles} = \frac{22}{7} \times 3.5 \times 3.5 \times 2$$

$$= 77 \text{ cm}^2$$

Rectangle:

$$l = 3 \text{ cm } b = 1 \text{ cm}$$

$$\text{Area} = l \times b = 3 \times 1 = 3 \text{ cm}^2$$

Remaining Area

$$= 616 - (77 + 3)$$

$$= 616 - 80 = 536 \text{ cm}^2$$

11. Aluminium sheet:

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

$$\text{Area} = 6 \times 6 = 36 \text{ cm}^2$$

Circle:  $r=2$  cm

$$\text{Area} = \pi r^2 = 3.14 \times 2 \times 2$$

$$= 12.56 \text{ cm}^2$$

Remaining Sheet:

$$36 - 12.56 = 23.44 \text{ cm}^2$$

12. Circumference of a circle = 31.4 cm

$$2\pi r = 31.4$$

$$r = 31.4 \times \frac{1}{2 \times 3.14}$$

$$r = \frac{31.4}{2 \times 3.14} \times \frac{10}{10}$$

$$r = \frac{31.4}{2 \times 3.14} \times 10$$

$$r = 5 \text{ cm}$$

$$\text{Area} = \pi r^2$$

$$= 3.14 \times 5 \times 5$$

$$\text{Area} = 78.5 \text{ cm}^2$$

13. Flower bed

$$d = 66 \text{ m}$$

$$r = 33 \text{ m}$$

$$\text{Area} = 3.14 \times 33 \times 33$$

$$= 3419.46 \text{ m}^2$$

Width of path = 4m

$\therefore$  Diameter of outer circle = 4 + 66 + 4 = 74 m

$$r = \frac{74}{2} = 37 \text{ m}$$

$$\text{Area} = 3.14 \times 37 \times 37$$

$$= 4298.66 \text{ m}^2$$

Area of the path = Area of outer circle - Area of Flower bed

$$= 4298.66 - 3419.46$$

$$= 879.2 \text{ m}^2$$

14. Flower Garden

$$\text{Area} = 314 \text{ m}^2$$

Sprinkler at the centre  $r=12$  m

$$\text{Area of sprinkler} = 3.14 \times 12 \times 12$$

$$= 452.16 \text{ m}^2$$

Yes, the sprinkler can water the entire garden.

15. Inner Circle:

$$r = 19 - 10 = 9 \text{ m}$$

$$\text{Circumference} = 2\pi r = 2 \times 3.14 \times 9$$

$$= 569.52 \text{ m}$$

Outer Circle:  $r=19$  m

$$\text{Circumference} = 2\pi r$$

$$= 2 \times 3.14 \times 19$$

$$= 119.32 \text{ m}$$

16. Radius of Wheel = 28 cm

Circumference of a circle = 1 full rotation

$$\text{Circumference of a circle} = 2 \times \frac{22}{7} \times 28$$

$$=176 \text{ cm}$$

$$\text{No. of rotation} = \frac{\text{Total distance}}{1 \text{ full rotation}}$$

$$= \frac{352 \text{ m}}{\frac{352 \text{ m}}{176 \text{ cm}}} = \frac{35200}{176}$$

$$= 200 \text{ rotations.}$$

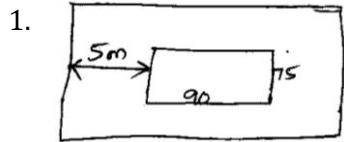
17. Length of minute hand = Radius of clock  
 $r = 15 \text{ cm}$

Tip of min. hand move in 1 hour = Circumference of clock

$$= 2 \times 3.14 \times 15$$

$$= 94.2 \text{ cm}$$

EX-11.4



Inner Rectangle:

$$\text{Area: } l \times b = 90 \times 75 = 6750 \text{ cm}^2$$

Outer Rectangle:

$$\text{Area: } = 100 \times 85$$

$$= 8500 \text{ m}^2$$

Area of path:

$$8500 - 6750 = 1750 \text{ m}^2$$

Area of Garden = Area of Inner Rectangle

Garden in hectare

$$10,000 \text{ m}^2 = 1 \text{ hectare}$$

$$1 \text{ m}^2 = \frac{1}{10,000} \text{ hec}$$

$$\therefore 6750 \text{ m}^2 = \frac{6750}{10000} \text{ hec}$$

$$= 0.675 \text{ hectare}$$

$$= 0.675 \text{ hec}$$

2. Rectangular Park

$$l = 125 \text{ m} \quad b = 65 \text{ m}$$

$$\text{Area} = l \times b = 125 \times 65 = 8125 \text{ m}^2$$

Wide of path = 3 cm

Outer of Rectangle:

$$l = 3 + 125 + 3 = 131 \text{ m}$$

$$b = 3 + 65 + 3 = 71 \text{ m}$$

$$\text{Area} = l \times b = 131 \times 71 = 9301 \text{ m}^2$$

Area of path

$$= 9301 - 8125$$

$$= 1176 \text{ m}^2$$

3. Cardboard

$$l = 8 \text{ cm} \quad b = 5 \text{ cm}$$

$$\text{Area} = 8 \times 5$$

$$= 40 \text{ cm}^2$$

Picture

$$l = 8 - 3 = 5 \text{ cm}$$

$$b = 5 - 3 = 2 \text{ cm}$$

$$\text{Area} = 5 \times 2 = 10 \text{ cm}^2$$

Area of margin:

$$= 40 - 10 = 30 \text{ cm}^2$$

4. Room:

$$l = 5.5 \text{ m}, \quad b = 4 \text{ m}$$

$$\text{Area} = 5.5 \times 4 = 22.0 \text{ m}^2$$

Width = 2.25 m

$$\text{Verandah: } l = 2.25 + 5.5 + 2.25 = 10 \text{ m}$$

$$b = 2.25 + 4 + 2.25 = 8.5 \text{ m}$$

$$\text{Area of outer Rectangle} = 10 \times 8.5$$

$$= 85$$

$$= 85 \text{ m}^2$$

i) Area of Verandah:

$$= 95 - 22 = 63 \text{ m}^2$$

ii) Cementing Verandah:

$$\text{Cost} = \text{Rs. } 200 / \text{m}^2$$

$$\therefore \text{For } 63 \text{ m}^2 = 63 \times 200$$

$$= 12600 \text{ Rs}$$

5. Square Garden

$$a = 30 \text{ m}$$

$$\text{Area} = 900 \text{ m}^2$$

Width = 1 m

Square Garden without path

$$a = 30 - 2 = 28 \text{ m}$$

$$\text{Area} = 28 \times 28$$

$$= 784 \text{ m}^2$$

i) Area of path:

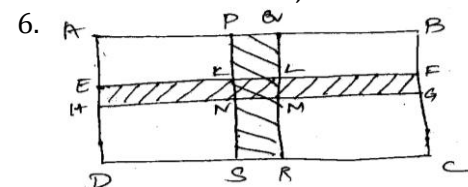
$$900 - 784 = 116 \text{ m}^2$$

ii) Cost:

$$\text{Rs. } 40 / \text{m}^2$$

$$\therefore \text{For } 116 \text{ m}^2 = 116 \times 40$$

$$= \text{Rs } 4640$$



$$\begin{aligned} PQ &= 10 \text{ m} & PS &= 300 \\ EH &= 10 \text{ m} & EF &= 700 \text{ m} \\ KL &= 10 \text{ m} & KN &= 10 \text{ m} \end{aligned}$$

$$\begin{aligned} \text{Area of road} &= \text{Area of PQRS} + \text{Area of EFGH} - \text{Area of KLMN} \\ &= 3000 + 700 - 100 \\ &= 9,900 \text{ m}^2 \end{aligned}$$

Area of hectare:

$$\begin{aligned} 1 \text{ m}^2 &= \frac{1}{10,000} \text{ hec} \\ 9900 \text{ m}^2 &= \frac{9900}{10000} \\ &= 0.99 \text{ hec} \end{aligned}$$

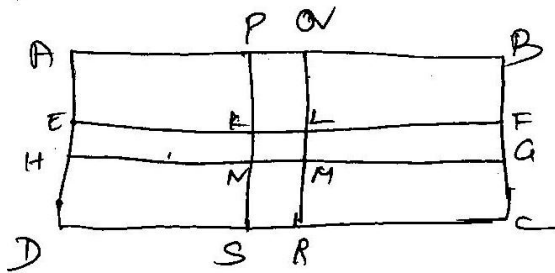
Area of Park:

$$700 \times 300 = 210000 \text{ m}^2$$

Area of park excluding cross roads:

$$\begin{aligned} 210000 - 9900 \\ &= 200100 \text{ m}^2 \\ &= 20.01 \text{ hectare} \end{aligned}$$

7.



$$\begin{aligned} PQ &= 3 \text{ m} & PS &= 60 \text{ m} \\ EH &= 3 \text{ m} & EF &= 90 \text{ m} \\ KL &= 3 \text{ m} & KN &= 3 \text{ m} \end{aligned}$$

$$\begin{aligned} \text{i) Area of road} &= \text{Area of PQRS} + \text{Area of EFGH} - \text{Area of KLMN} \\ &= 180 + 270 - 9 \\ &= 441 \text{ m}^2 \end{aligned}$$

ii) Cost of constructing road:

$$\begin{aligned} &\text{Rs } 110 \text{ per m}^2 \\ \therefore \text{ For } 441 \text{ m}^2 &= 441 \times 110 \\ &= 48,510 \text{ Rs} \end{aligned}$$

8. Radius of pipe = 4 cm

$$\begin{aligned} \text{Wrapping around circle} &= 2\pi r \\ &= 2 \times 3.14 \times 4 \\ &= 25.12 \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{Wrapping around square} &= 4a \\ &= 4 \times 4 = 16 \text{ cm} \end{aligned}$$

Remaining Cord = Cord Wrapped on Pipe - Square

$$\begin{aligned} &= 25.12 - 16 \\ &= 9.12 \text{ cm} \end{aligned}$$

She has left 9.12 cm cord.

$$9. l = 10 \text{ m} \quad r = 3 \text{ m} \quad b = 5 \text{ m}$$

$$\begin{aligned} \text{i) Area of whold land} &= l \times b \\ &= 10 \times 5 = 50 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} \text{ii) Area of flower bed} &= \pi r^2 \\ &= 3.14 \times 2 \times 2 \\ &= 12.56 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} \text{iii) Area of lawn excluding flower bed} \\ 50 - 12.56 &= 37.44 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} \text{iv) Circumference of flower bed} &= 2\pi r \\ &= 2 \times 3.14 \times 2 \\ &= 12.56 \text{ m} \end{aligned}$$

$$10. \text{ i) } l = 18 \text{ cm}$$

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

$$\text{Area of Rectangle} = 180 \text{ cm}^2$$

$$\begin{aligned} \text{Area of Triangle I} &= \frac{1}{2} \times b \times h \\ &= \frac{1}{2} \times 10 \times 6 \\ &= 30 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Area of Triangle II} &= \frac{1}{2} \times 8 \times 10 \\ &= 40 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Area of Shaded part} \\ &= 180 - (30 + 40) \\ &= 110 \text{ cm}^2 \end{aligned}$$

ii) Area of square

$$= 20 \times 20 = 400 \text{ cm}^2$$

$$\begin{aligned} \text{Area of Triangle I} &= \frac{1}{2} \times 10 \times 10 \\ &= 50 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Area of Triangle II} &= \frac{1}{2} \times 10 \times 20 \\ &= 100 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Area of Triangle III} &= \frac{1}{2} \times 10 \times 20 \\ &= 100 \text{ cm}^2 \end{aligned}$$

Area of Shaded part

$$\begin{aligned} &= 400 - (50 + 100 + 100) \\ &= 150 \text{ cm}^2 \end{aligned}$$

11. Area of quadrilateral ABCD = Area of Triangle ABC + Area of Triangle ACD

$$\begin{aligned} &= \frac{1}{2} \times 22 \times 3 + \frac{1}{2} \times 22 \times 3 \\ &= 33 + 33 \\ &= 66 \text{ cm}^2. \end{aligned}$$