

Mensuration-I Area of a Trapezium and a Polygon EX-20.1

MENSURATION - I

Exercise - 20.1

1. Given: Base (b) = 24cm
 $= 0.24\text{ m}$ [$\because 1\text{ m} = 100\text{ cm}$]
 height (h) = 10cm
 $= 0.10\text{ m}$

As we know

Area of Parallelogram

$$(A) = b \times h \text{ m}^2$$

$$= 0.24 \times 0.10$$

$$= 0.024 \text{ m}^2$$

Each flooring tile area = 0.024 m^2

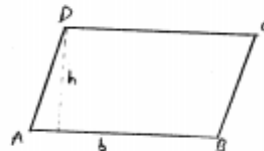
let 'n' be no. of such tiles

$$\therefore \text{given } n \times A = 1080 \text{ m}^2$$

$$\Rightarrow n \times 0.024 = 1080$$

$$\Rightarrow n = \frac{1080}{0.024} = 45000$$

$\therefore$ The no. of such tiles which cover 1080 m^2 are 45,000.

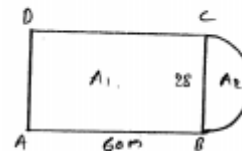


2. Given Plot:
 The area of given plot can be given as

$$A = A_1 + A_2$$

A_1 = Area of Rectangle

A_2 = Area of Semicircle.





2. — continued

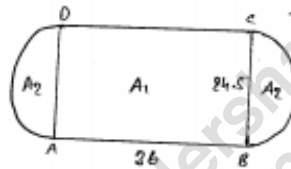
$$\begin{aligned}
 A_1 &= \text{length} \times \text{breadth} \quad \left\{ \because \text{area of rectangle} = l \times b \right\} \\
 &= 60 \times 28 \\
 &= 1680 \text{ m}^2
 \end{aligned}$$

$$\begin{aligned}
 A_2 &= \frac{\pi r^2}{2} \quad \left\{ \because \begin{array}{l} \text{Area of circle} = \pi r^2 \\ \text{Semicircle} = \frac{\pi r^2}{2} \end{array} \right\} \\
 \text{radius } (r) &= \frac{BC}{2} = \frac{28}{2} \\
 &= 14 \text{ m}
 \end{aligned}$$

$$\begin{aligned}
 \Rightarrow A_2 &= \frac{\pi \times (14)^2}{2} \\
 &= 307.876 \text{ m}^2
 \end{aligned}$$

$$\begin{aligned}
 \text{Therefore, Area of Plot} &= A_1 + A_2 \\
 &= 1680 + 307.876 \\
 A &= 1987.876 \text{ m}^2 \\
 A &= 1988 \text{ m}^2 \text{ (rounded off)}.
 \end{aligned}$$

3.



Given: A Play ground of the above shape with given dimensions.

$$\rightarrow \text{radius of semi circle} = \frac{BC}{2} = \frac{24.5}{2} = 12.25 \text{ m}$$

$$\text{Area of Play ground } A = A_1 + 2A_2$$



3 - continued.

$$\begin{aligned}
 A_1 &= l \times b \\
 &= 36 \times 24.5 \\
 &= 882 \text{ m}^2
 \end{aligned}$$

$$\begin{aligned}
 2. A_2 &= 2 \times \frac{\pi r^2}{2} = \pi \times (12.25)^2 \\
 &= 471.435 \text{ m}^2
 \end{aligned}$$

$$\begin{aligned}
 \text{Area of Playground } A &= A_1 + A_2 \\
 &= 882 + 471.43 \\
 &= 1353.435 \text{ m}^2
 \end{aligned}$$

$\therefore$ Area of Play ground is 1353.435 m^2 .

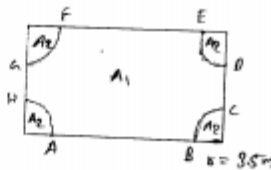
4.

Given:-

Rectangle Piece

length = 20m

breadth = 15m

Let A_1 = Area of rectangle A_2 = Area of quadrant part.

The Area of remaining part after removing corners

$$\text{is } A = A_1 - 4A_2$$

$$A_1 = 20 \times 15 = 300 \text{ m}^2$$

$$\begin{aligned}
 A_2 &= \frac{1}{4} \times \pi r^2 = \pi (3.5)^2 \quad \left[\because \text{four corners form a circle} \right] \\
 &= 38.48 \text{ m}^2
 \end{aligned}$$

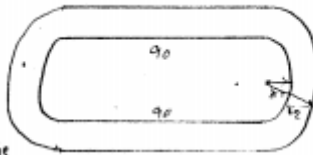
$$A = A_1 - A_2 = 300 - 38.48$$

$$A = 261.52 \text{ m}^2$$



5.

Let r_1 be the inner radius and r_2 be the outer radius



We know the side length is 90m

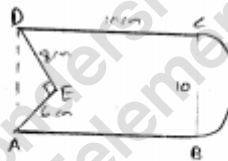
$$\begin{aligned} \therefore \text{Perimeter} &= 2l + 2\pi r = 400 \\ 180 + 2\pi r_1 &= 400 \quad [\because l = 90\text{m}] \\ r_1 &= 35.01\text{m} \end{aligned}$$

$$\begin{aligned} \therefore r_2 &= r_1 + \text{width} \\ &= 35.01 + 14 = 49.01\text{m} \quad [\because \text{given width} = 14\text{m}] \end{aligned}$$

$$\begin{aligned} \therefore \text{Area} &= 2 \times l \times w + \pi [r_2^2 - r_1^2] \\ &= 2 \times 90 \times 14 + \pi [49.01^2 - 35.01^2] \\ &= \underline{6214 \text{ m}^2} \end{aligned}$$

$$\begin{aligned} \text{length of outer track} &= 180 + 2\pi r_2 \\ &= 180 + 2\pi \times 49.01 = \underline{488 \text{ m}^2} \end{aligned}$$

6. Area of given figure can be written as



$A = \text{Area of } ABCD -$

$\text{Area of } DEA + \text{Area of } ABC$

$$= 10 \times 10 - \left(\frac{1}{2} \times 8 \times 6 \right) + \frac{\pi}{2} \times \left(\frac{5}{2} \right)^2$$

$$= 100 - 24 + 39.26 = 115.3 \text{ cm}^2$$



7. Given

$$\text{diameter of wheel} = 90 \text{ cm}$$

$$\text{No. of revolutions} = 315/\text{min}$$

we know that

$$v = r\omega$$

$$v = \frac{0.45 \times 2 \times \pi \times 315 \times 60}{1000} \text{ km/hr}$$

$$v = 53.46 \text{ km/hr}$$

8. Given, Area of rhombus = 240 cm^2

$$\text{diagonal } d_1 = 16 \text{ cm}$$

$$\text{diagonal } d_2 = ?$$

$$\therefore A = \frac{1}{2} d_1 d_2$$

$$240 = \frac{16 \times d_2}{2} \Rightarrow d_2 = \underline{\underline{30 \text{ cm}}}$$

9. Given, diagonal $d_1 = 7.5 \text{ cm}$

$$\text{diagonal } d_2 = 12 \text{ cm}$$

$$\text{Area} = \frac{1}{2} \times d_1 \times d_2$$

$$= \frac{1}{2} \times 7.5 \times 12$$

$$= 45 \text{ cm}^2$$



10. Given

lengths of opposite sides

$$a = 8\text{ m}$$

$$b = 13\text{ m}$$

$$\text{height} = 24\text{ m}$$

$$\begin{aligned}\therefore \text{Area of quadrilateral } A &= \frac{1}{2} \times h(a+b) \\ &= \frac{1}{2} \times 24(13+8) \\ &= \underline{252\text{ m}^2}\end{aligned}$$

11. Given,

$$\text{Side length of Rhombus} = 6\text{ cm}$$

$$\text{Altitude} = 4\text{ cm}$$

$$\therefore \text{other parallel side length} = 6\text{ cm} \quad [\because \text{rhombus}]$$

$$\begin{aligned}\therefore \text{Area} &= \frac{1}{2} \times 4 \times [6+6] \quad [\because \text{Area of quadrilateral} \\ &= \underline{24\text{ cm}^2} \quad = \frac{1}{2} \times h(a+b)]\end{aligned}$$

$$24 = \frac{1}{2} \times d_1 \times d_2$$

$$\frac{24 \times 2}{8} = d_2 \quad [\because \text{diagonal } d_1 = 8\text{ cm}]$$

$$\therefore \underline{d_2 = 6\text{ cm}}$$



12.

Given,

lengths of diagonals

$$d_1 = 45 \text{ cm}$$

$$d_2 = 30 \text{ cm}$$

$$\begin{aligned} \text{Area} &= \frac{1}{2} \times d_1 \times d_2 = \frac{45 \times 30}{2} \\ &= 675 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Area of 3000 tiles} &= 675 \times 3000 \\ &= 2025000 \text{ cm}^2 \\ &= 202.5 \text{ m}^2 \quad \{\because 1 \text{ m}^2 = 10^4 \text{ cm}^2\} \end{aligned}$$

Cost per m^2 is 4/-

$$\begin{aligned} \therefore \text{cost for } 202.5 \text{ m}^2 &\text{ is } \Rightarrow 202.5 \times 4 \\ &= \underline{\underline{810/-}} \end{aligned}$$

13.

Given, inner length $l_1 = 112 \text{ m}$ inner breadth $b_1 = 78 \text{ m}$

$$\begin{aligned} \text{outer length} &= l_1 + 2w \\ &= 112 + 5 = 117 \text{ m} \end{aligned}$$

$$\text{outer breadth} = b_1 + 2w = 83 \text{ m}$$

$$\begin{aligned} \text{Area of gravel path} &= l_2 b_2 - l_1 b_1 \\ &= 117 \times 83 - 78 \times 112 \\ &= 975 \text{ m}^2 \end{aligned}$$

$$\text{Cost} = 975 \times 4.5 = 4387.5/-$$





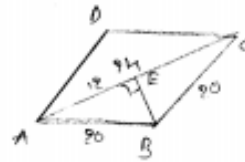
14. Area of rhombus whose sides are 20 cm each
diagonal length = 24 cm

From $\triangle ABE$

$$AB^2 = AE^2 + EB^2$$

$$400 - 144 = EB^2$$

$$EB = 16 \text{ cm.}$$



$$\therefore \text{Area of } \triangle AEB = \frac{1}{2} \times 16 \times 12 \\ = 96 \text{ cm}^2$$

$$\therefore \text{Area of rhombus} = 4 \times \triangle AEB \\ = 4 \times 96 \\ = \underline{\underline{384 \text{ cm}^2}}$$

15. Area of square = $4^2 = 16 \text{ m}^2$
diagonal $d_1 = 2 \text{ m}$

$$\text{Area of rhombus} = \frac{1}{2} \times d_1 \times d_2$$

$$\therefore d_2 = \underline{\underline{16 \text{ m}}}$$



16. Given,

$$\text{Side of Rhombus} = 14 \text{ cm}$$

$$\text{Altitude } h = 16 \text{ cm}$$

$$\begin{aligned}\text{Area of Quadrilateral (or Rhombus)} &= \frac{1}{2} \times h (a+b) \\ &= \frac{1}{2} \times 16 \times (14+14) \\ &= \underline{\underline{224 \text{ cm}^2}}\end{aligned}$$

17. Given,

Cost of fencing per meter is Rs. 0.6/-

$$\text{Total cost of fencing} = \text{Perimeter} \times \text{Cost}$$

$$1200 = 4a \times 0.6 \quad [\because \text{given}]$$

$$\therefore a = 500 \text{ m}$$

$$\text{Area} = 500 \times 500 = 250000 \text{ m}^2$$

$$\text{Cost for } 100 \text{ m}^2 = \text{Rs } 0.5/-$$

$$\begin{aligned}\therefore \text{Total cost} &= 2500 \times 0.5 \\ &= \underline{\underline{\text{Rs } 1250}}\end{aligned}$$

18. Given Area of square plot = Area of Rectangular plot

$$\Rightarrow 84 \times 84 = 144 \times b$$

$$\Rightarrow b = 49 \text{ m}$$

$$\therefore \text{width} = \underline{\underline{49 \text{ m}}}$$



19.

Given,

$$\text{Area of Rhombus} = 84 \text{ m}^2$$

$$\text{Perimeter} = 40 \text{ m}$$

$$\therefore 4a = 40$$

$$a = 10 \text{ m}$$

$$\Rightarrow \frac{1}{2} \times b \times h = 84$$

$$\therefore \frac{1}{2} \times b \times a = \text{Area}$$

$$h = 8.4 \text{ m}$$

20.

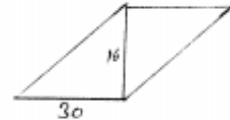
Given,

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

$$\text{Altitude} = 16 \text{ m}$$

$$\text{Area} = 2 \left[\frac{1}{2} \times 30 \times 16 \right]$$

$$= 480 \text{ m}^2$$

 $\therefore$ two times Area of Δ^{ce} ,

Cost of leveling is RS 2/- per m^2

$$\therefore \text{Total Cost} = 480 \times 2 = \text{RS } 960/-$$

21.

Given,

Rhombus dimensions as

$$\text{Side length} = 64 \text{ m}$$

$$\text{Altitude} = 16 \text{ m}$$

$$\text{Area} = \frac{1}{2} \times 16 \times [64 + 64]$$

$$= 1024 \text{ m}^2$$

Given Area is equal to Area of a Square

$$\therefore 1024 = a^2$$

$$\Rightarrow a = 32 \text{ m}$$

22.

Given

$$\text{Area of } \Delta^{ce} = \text{Area of Rhombus}$$

$$\frac{1}{2} \times b \times h = \frac{1}{2} \times d_1 \times d_2$$

$$24.8 \times 16.5 = 22 \times d_2$$

$$d_2 = 18.6 \text{ cm}$$



Mensuration-I Area of a Trapezium

Polygon Ex 20.2

EXERCISE - 20.2

1. (i) Given dimensions are

$$\text{bases} = 12 \text{ dm} = 1.2 \text{ m}$$

$$20 \text{ dm} = 2.0 \text{ m}$$

$$\text{Altitude} = 10 \text{ dm} = 1.0 \text{ m} \quad [\because 1 \text{ dm} = 10^{-1} \text{ m}]$$

$$\text{Area} = \frac{1}{2} \times \text{Altitude} \times (\text{sum of bases})$$

$$= \frac{1}{2} \times 1.0 \times (2.0 + 1.2) = \underline{\underline{1.6 \text{ m}^2}}$$

(ii) bases = 28 cm = 0.28 m

$$3 \text{ dm} = 0.3 \text{ m}$$

$$\text{Altitude} = 25 \text{ cm} = 0.25$$

$$\text{Area} = \frac{1}{2} \times 0.25 \times (0.3 + 0.28)$$

$$= \underline{\underline{0.0725 \text{ m}^2}}$$

(iii) bases = 8 m

$$60 \text{ dm} = 6 \text{ m}$$

$$\text{Altitude} = 40 \text{ dm} = 4 \text{ m}$$

$$\text{Area} = \frac{1}{2} \times 4 \times (8 + 6)$$

$$= \underline{\underline{28 \text{ m}^2}}$$

(iv) bases = 150 cm = 1.5 m

$$30 \text{ dm} = 3 \text{ m}$$

$$\text{Altitude} = 9 \text{ dm} = 0.9 \text{ m}$$

$$\text{Area} = \frac{1}{2} \times 0.9 (1.5 + 3) = \underline{\underline{2.025 \text{ m}^2}}$$



2. Given,

$$\text{base} = 15\text{cm} = 0.15\text{m}$$

$$\therefore 1\text{cm} = 0.01\text{m}$$

$$\text{height} = 8\text{cm} = 0.08\text{m}$$

$$\text{Parallel side} = 9\text{cm} = 0.09\text{m}$$

$$\text{Area} = \frac{1}{2} \times h \times [a+b] = \frac{0.08}{2} [0.15+0.09]$$

$$= 9.6 \times 10^{-3} \text{m}^2$$

$$= \underline{\underline{96 \text{ cm}^2}}$$

3. Given,

$$\text{Sides are } 16\text{dm} = 1.6\text{m}$$

$$22\text{dm} = 2.2\text{m}$$

$$\text{height is } 12\text{dm} = 1.2\text{m}$$

$$\text{Area} = \frac{1}{2} \times 1.2 [1.6+2.2]$$

$$= \underline{\underline{2.28 \text{ m}^2}}$$

4. Given, Area = 600cm^2

$$\text{Sum of parallel sides} = 60\text{cm}$$

$$\therefore \text{Area} = \frac{1}{2} \times \text{Altitude} \times \text{Sum of parallel sides}$$

$$600 = \frac{1}{2} \times h \times 60$$

$$h = \underline{\underline{20\text{cm}}}$$



5. Given,

$$\text{Area} = 65 \text{ cm}^2$$

bases are 13 cm, 26 cm

$$\text{Sum of bases} = 13 + 26 = 39 \text{ cm}$$

$$\therefore \text{Area} = \frac{1}{2} \times h \times \text{Sum}$$

$$65 = \frac{1}{2} \times h \times 39$$

$$h = \frac{10}{3} \text{ cm}$$

6. Given, Area of Trapezium = 4.2 m^2

$$\text{height} = 280 \text{ cm} = 2.8 \text{ m}$$

$$\therefore 4.2 = \frac{1}{2} \times 2.8 \times \text{Sum}$$

$$\therefore \text{Sum of bases} = 3 \text{ m}$$

7.

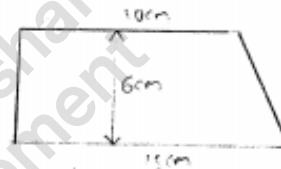
Given,

Sides of trapezium

as 10 cm and

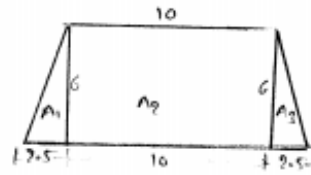
15 cm

height (or) distance b/w them be 6 cm





- 7 (i) The figure shows that A_1 , A_3 are the areas of two triangles and A_2 be the area of rectangle.

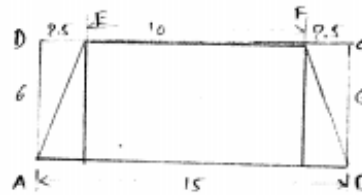


$$\therefore A_1 = \frac{1}{2} \times 2.5 \times 6 = 7.5 \text{ cm}^2 = A_3$$

$$A_2 = 10 \times 6 = 60 \text{ cm}^2$$

$$\text{Total (or) Trapezium Area} = A_1 + A_2 + A_3 = 60 + 7.5 + 7.5 = 75 \text{ cm}^2.$$

- (ii) The given question can be written as



Area of trapezium

$$= \text{Area of rectangle } ABCD - [\text{Area of } \triangle DEA + \text{Area of } \triangle FCB].$$

$$\therefore \text{Area of rectangle } ABCD = 15 \times 6 = 90 \text{ cm}^2$$

$$\text{Area of } \triangle DEF \text{ (or) } \triangle FCB = \frac{1}{2} \times 2.5 \times 6 = 7.5 \text{ cm}^2$$

$$\therefore \text{Area of trapezium} = 90 - [7.5 + 7.5] = \underline{\underline{75 \text{ cm}^2}}$$



8. Given,

$$\text{Area of Trapezium} = 960 \text{ cm}^2$$

The Parallel sides are 34 cm & 46 cm

$$\therefore \text{Area} = \frac{1}{2} \times h \times [34 + 46]$$

$$\frac{960 \times 2}{[34 + 46]} = h = 24 \text{ cm}$$

9.

The Area of the figure can be given as

$$A_1 + A_2 + A_3 = A$$

where

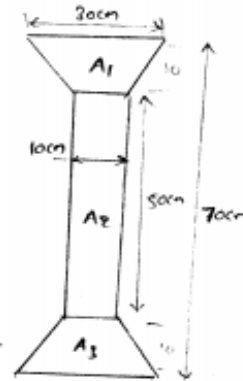
 A_1 = Area of Trapezium A_2 = Area of Rectangle A_3 = Area of Trapezium

$$A_1 = \frac{1}{2} \times 10 \times [30 + 10] = 200 \text{ cm}^2$$

$$A_2 = 50 \times 10 = 500 \text{ cm}^2$$

$$A_3 = \frac{1}{2} \times 10 \times [30 + 10] = 200 \text{ cm}^2$$

$$A = 200 + 500 + 200 = 900 \text{ cm}^2$$





10. Given

Top surface of table is trapezium

Parallel sides are 1m & 1.2m

distance b/w them is 0.8

$$\therefore A = \frac{1}{2} \times 0.8 \times [1 + 1.2]$$

$$= 0.4 \times 2.2$$

$$= 0.88 \text{ m}^2$$

=

11. Given

Top width = 10m

bottom width = 6m

Area = 72 m²

$$\therefore \text{Area} = \frac{1}{2} \times h \times [10 + 6]$$

$$\frac{72 \times 2}{16} = h. = \underline{9 \text{ m}}$$

12. Given

Area of trapezium = 891 cm²

height = 7m

let 'x' be one of length of side

Given other is longer by 8cm

$$\therefore \text{other side is } (x + 8)$$



12.

$$\therefore \text{Area} = \frac{1}{2} \times h \times [a+b]$$

$$91 = \frac{1}{2} \times 7 \times [1+18]$$

$$\frac{91 \times 2}{7} = 1+18$$

$$1 = 9 \text{ cm}$$

$\therefore$ one side is 9 cm
other side is 17 cm.

13. Given,

$$\text{Area} = 384 \text{ cm}^2$$

$$\text{Height} = 12 \text{ cm}$$

$$\text{ratio} = 3:5$$

$$\therefore 384 = \frac{1}{2} \times 12 \times 8a$$

$$a = 8.$$

$$\therefore \text{Sides are } 8 \times 3, 5 \times 8 = 24 \text{ cm, } 40 \text{ cm.}$$

14.

Given

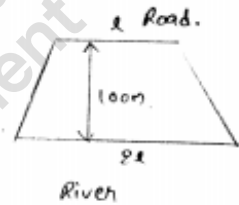
$$\text{Area} = 10500 \text{ m}^2$$

$$\text{height} = 100 \text{ m}$$

$$\therefore 10500 = \frac{1}{2} \times 100 \times [1+2l]$$

$$l = 70 \text{ m.}$$

$\therefore$ The length of side on river side is 140 m





15. Area of trapezium = 1586 cm^2
 distance = 26 cm
 one side = 38 cm let 'x' be other side.

$$1586 = \frac{1}{2} \times 26 \times [38 + x]$$

$$x = 84 \text{ cm}$$

16. Given parallel sides lengths are 25 cm & 13 cm
 other two are 10 cm each.

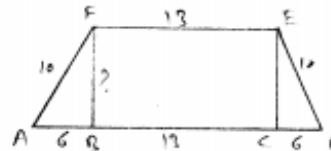
from $\triangle ABF$

$$AF^2 = AB^2 + FB^2$$

$$100 - 36 = FB^2$$

$$\therefore FB = 8 \text{ cm}$$

$$\therefore \text{Area} = \frac{1}{2} \times 8 \times [13 + 25] \\ = 152 \text{ cm}^2$$



17. Same as the above problem figure

$$\triangle ABF \quad AF = 15 \text{ cm}$$

$$\therefore 15^2 - 36 = FB^2 \Rightarrow FB = 3\sqrt{21} \text{ cm}$$

$$\text{Area} = \frac{1}{2} \times 3\sqrt{21} \times [25 + 13] = \underline{\underline{87\sqrt{21} \text{ cm}^2}}$$



18.

$$\text{Area} = 28 \text{ cm}^2$$

$$\text{Side } 1 = 6 \text{ cm}$$

$$\text{height} = 4 \text{ cm}$$

$$A = \frac{1}{2} \times h \{a+b\}$$

$$\therefore 28 = \frac{1}{2} \times 4 \times \{6+x\}$$

$$\frac{28}{2} = 6+x$$

$$x = 8 \text{ cm}$$

19.

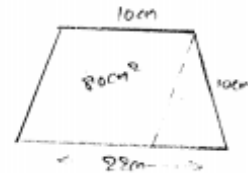
Area of Parallelogram is 80 cm^2

we know

$$b \times h = 80$$

$$10 \times h = 80$$

$$h = 8 \text{ cm}$$



$$\text{Area of Trapezium} = \frac{1}{2} \times 8 \times \{10+22\}$$

$$= \frac{1}{2} \times 8 \times 32$$

$$= 128 \text{ cm}^2$$

20.

The given figure can be split into a Square, Rectangle and a Trapezium.

 $A_1 = \text{Square area}$

$$= 4 \times 4 = 16 \text{ cm}^2$$

 $A_2 = \text{Rectangle area}$

$$= 4 \times 8 = 32 \text{ cm}^2$$

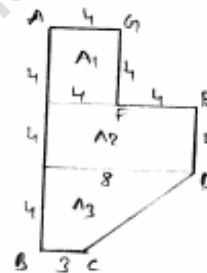
 $A_3 = \text{Trapezium Area}$

$$= \frac{1}{2} \times 4 \times \{8+3\} = 22 \text{ cm}^2$$

$$\text{Total Area (A)} = A_1 + A_2 + A_3$$

$$= 16 + 32 + 22$$

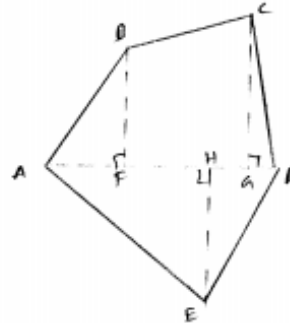
$$= 70 \text{ cm}^2$$



Mensuration-I Area of a Trapezium Polygon Ex 20.3

EXERCISE - 20.3

1. Given $AD = 10\text{ cm}$ $CG = 7\text{ cm}$
 $AG = 8\text{ cm}$ $EH = 3\text{ cm}$,
 $AH = 6\text{ cm}$
 $AF = 5\text{ cm}$
 $BF = 5\text{ cm}$



Area of Pentagon =

Area of $\triangle AED$ +
 Area of $\triangle ABF$ + Area of $\triangle GDC$ +
 Area of trapezium BCFG.

$$\begin{aligned}\text{Area of } \triangle AED &= \frac{1}{2} \times AD \times EH \\ &= \frac{1}{2} \times 10 \times 3 = 15\text{ cm}^2\end{aligned}$$

$$\text{Area of } \triangle ABF = \frac{1}{2} \times AF \times BF = \frac{1}{2} \times 5 \times 5 = 12.5\text{ cm}^2$$

$$\begin{aligned}\text{Area of } \triangle GDC &= \frac{1}{2} \times GD \times GC = \frac{1}{2} \times 2 \times 7 = 7\text{ cm}^2 \\ &\quad [\because AD - AG = GD].\end{aligned}$$

$$\begin{aligned}\text{Area of BCFG} &= \frac{1}{2} \times BG \times [BF + CG] = 18\text{ cm}^2 \\ &\quad [\because FG = 3].\end{aligned}$$

$$\begin{aligned}\therefore \text{Total Area} &= 15 + 12.5 + 7 + 8 \\ &= \underline{\underline{52.5\text{ cm}^2}}\end{aligned}$$

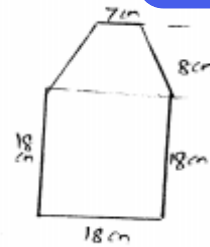


2.

(i)

Area = rectangle area +
Trapezium area

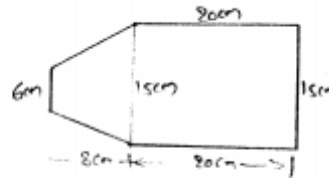
$$= 18 \times 18 + \frac{1}{2} \times 8 \times [7+18]$$
$$= 484 \text{ cm}^2$$



(ii)

Area = rectangle area +
Trapezium area

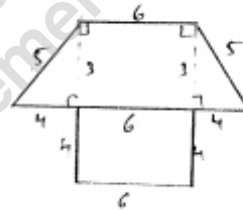
$$= 20 \times 15 + \frac{1}{2} \times 8 \times [6+15]$$
$$= 384 \text{ cm}^2$$



(iii)

Area = rectangle area +
Trapezium area

$$= 4 \times 6 + \frac{1}{2} \times 3 \times [14+6]$$
$$= 54 \text{ cm}^2$$





3.

(i) Jyoti's diagram Area:

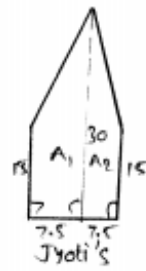
$$A_1 = \frac{1}{2} \times 7.5 \times [15 + 30]$$

$$= 168.75$$

$$A_2 = \frac{1}{2} \times 7.5 \times [15 + 30]$$

$$= 168.75$$

$$\text{Total Area} = 2 \times 168.75 = \underline{\underline{337.5 \text{ m}^2}}$$



(ii) Kavita's diagram Area:

 $A_1 = \text{Area of triangle}$

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

$$= 112.5 \text{ m}^2$$

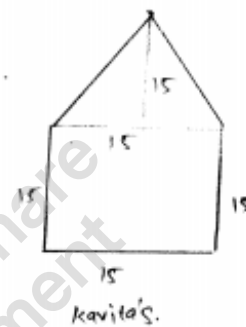
 $A_2 = \text{Area of rectangle}$

$$= 15 \times 15$$

$$= 225$$

$$\text{Total} = A_1 + A_2 = 112.5 + 225$$

$$= \underline{\underline{337.5 \text{ m}^2}}$$

 $\therefore$ Both the areas are equal



4. Given,

$$AL = 10\text{cm}, \quad AO = 60\text{cm}$$

$$AM = 20\text{cm}, \quad AD = 90\text{cm}$$

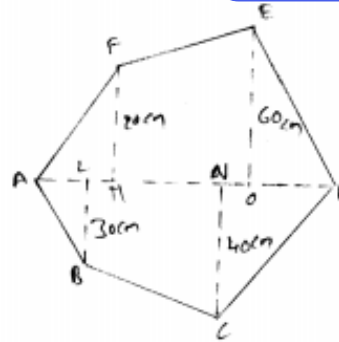
$$AN = 50\text{cm}$$

from figure?

$$FM = 20\text{cm}, \quad NC = 40\text{cm}$$

$$OE = 60\text{cm}$$

$$LB = 30\text{cm}$$



$$\begin{aligned} \text{Area of polygon} &= \text{Area of } \triangle AFM + \\ &\quad \text{Area of } \triangle ODE + \text{Area of } \triangle ALB + \\ &\quad \text{Area of } \triangle DNC + \text{Area of trapezium} \\ &\quad \text{FEOM} + \\ &\quad \text{Area of trapezium LOBC} \end{aligned}$$

$$\text{Area of } \triangle AFM = \frac{1}{2} \times AM \times FM = \frac{1}{2} \times 20 \times 20 = 200\text{cm}^2$$

$$\text{Area of } \triangle ODE = \frac{1}{2} \times 30 \times 60 = 900\text{cm}^2$$

$$\text{Area of } \triangle ALB = \frac{1}{2} \times AL \times LB = \frac{1}{2} \times 10 \times 30 = 150\text{cm}^2$$

$$\text{Area of } \triangle DNC = \frac{1}{2} \times DN \times NC = \frac{1}{2} \times 40 \times 40 = 800\text{cm}^2$$

$$\text{Area of FEOM} = \frac{1}{2} \times 30 \times [20 + 60] = 1200\text{cm}^2$$

$$\text{Area of LOCB} = \frac{1}{2} \times 40 \times [40 + 30] = 1400\text{cm}^2$$

$$\begin{aligned} \text{Total Area} &= 1400 + 1200 + 800 + 150 + 900 + 200 \\ &= 5050\text{cm}^2 \end{aligned}$$

5. Area of regular hexagon

$$\begin{aligned} &= \text{Area of } \triangle MNO + \text{Area of rectangle} \\ &\quad \text{MOPR} + \\ &\quad \text{Area of } \triangle RPO \end{aligned}$$

$$\Rightarrow \text{Area of } \triangle MNO = \frac{1}{2} \times 5 \times 13\sqrt{3}$$

$$\text{Area of } \triangle RPO = \frac{1}{2} \times 5 \times 13\sqrt{3}$$

$$\text{Area of MRPo} = 13 \times 13\sqrt{3}$$

$$\text{Area of regular hexagon} = 405.29\text{m}^2$$

