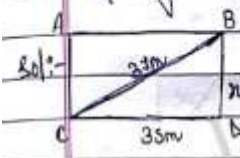


7th Mensuration Test Paper – 01

1. Find area of rectangle having one side 35m and one diagonal is 37m [12m, 420m²]

Q.1. Find Area of rect having one side is 35m and one diagonal is 37m [12m, 420m²].



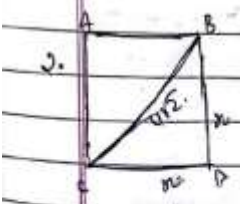
Sol:-

Pythagoras theorem $\Rightarrow 37^2 = 35^2 + x^2$
 $1369 = 1225 + x^2$
 $1369 - 1225 = x^2$
 $144 = x^2$
 $\sqrt{144} = x$
 $12m = x$ side

Area of rect = $l \times b$
 $= 35 \times 12$
 $= 420m^2$ Area

2. Find area of square having diagonal $4\sqrt{2}m$

Q.2.

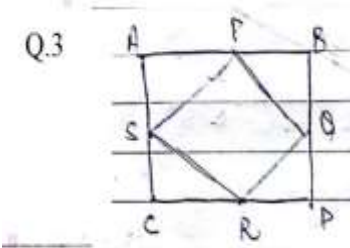


$(BC)^2 = AB^2 + AC^2$
 $= (4\sqrt{2})^2 = x^2 + x^2$
 $= 16 \times 2 = 2x^2$
 $= x^2 \Rightarrow 32/2 = 16$
 $= x^2 = 16$
 $= x = 4$ $\sqrt{16}$

Area of square = $(side)^2 = 4^2 = 16m^2$

3. Find the area of square that is obtained by joining midpoint of square ABCD of area 36cm².

Q.3.



Area of ABCD = 36 cm²
 $x \times x = 36$
 $x^2 = 36$
 $x = \sqrt{36}$
 $x = 6$

AP = PB = 3cm.

In $\triangle POB$

$PO^2 = PB^2 + BO^2$
 $30^2 = 3^2 + 3^2$
 $PO^2 = 9 + 9$
 $PO^2 = 18$
 $PO = \sqrt{18} = 3\sqrt{2}$

4. A room have dimensions $9m \times 8m \times 6.5m$. It has one door of dimensions $(2m \times 1.5m)$ and four windows each $(1.5m \times 1m)$. Find the cost of white washing at Rs. 25 per m² [Rs. 5300]

Q.4. Area of 4 wall = $2(l+b) \times h$
 $= 2(9+8) \times 6.5$
 $= 34 \times 6.5$
 $= 221m^2$

Area of 1 door = $2m \times 1.5m$
 $= 3.0m^2$

Area of 4 window = $4(1.5)$
 $= 4 \times 1.5$
 $= 6.0m^2$

Area of feining = $221 - (3+6)$
 $= 221 - 9$
 $= 212$

Cost of feining = $25 \times 212 = 5300$ Rs.

5. The sides of rectangle are in ratio 4 : 3. If its area is 1728m². Find the cost of fencing at Rs. 30 per m² [Rs. 5040]

5. Let the width be x

$$4x \times 3x = 1728$$

$$12x^2 = 1728$$

$$x^2 = 1728/12$$

$$x^2 = 144$$

$$x = \sqrt{144}$$

$$x = 12$$

$\therefore 4 \times 12 = 48 \Rightarrow B = 12 \times 3 = 36$

$$P = 2(l+b)$$

$$P = 2(48+36)$$

$$P = 2 \times 84$$

$$P = 168$$

$$\text{Cost} = 168 \times 30 = 5040$$

6. (a) Find the largest pole placed in a room 10m x 10m x 5m?

6. (a) Largest = $\sqrt{l^2 + b^2 + h^2}$

$$= \sqrt{10^2 + 10^2 + 5^2}$$

$$= \sqrt{100 + 100 + 25}$$

$$= \sqrt{225}$$

Largest pole = 15 m

(b) If Area of square is $\frac{1}{2}$ hectare. Find its diagonal?

6. (b) $\frac{1}{2}$ x hectare = Area of sq.

$$\frac{1}{2} \times 10000 = \text{side}^2 = \frac{1}{2} \times 10000$$

$$5000 = d^2$$

$$d = \sqrt{5000}$$

7. A wire is in form of square side 10cm. If wire is rebent into a rectangle of length 12cm find its breadth. Which figure has more area and by how much [8cm, 4cm²]

7. P of sq = $4 \times \text{side}$

$$= 4 \times 10$$

$$= 40$$

P of Rect = $2(l+b) = P$

$$40 = 2(12+b)$$

$$40/2 = 12+b$$

$$20 = 12+b$$

$$20-12 = b$$

$$8 = b$$

breadth = 8cm. Area =

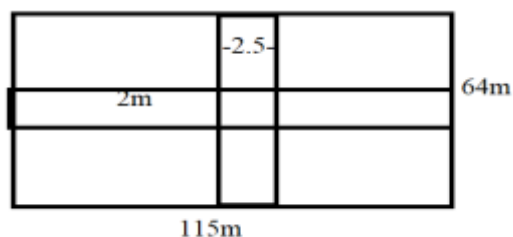
Area of square = Area of Rect

$$10 \times 10 = 12 \times 8$$

$$100 = 96$$

4cm². Area

8. A rectangular park is 115m by 64m has two cross road at right angle one 2m wide parallel to length and other 2.5 m wide parallel to breadth. Find cost of gravelling cross road of at 60 per m². [Rs.23100]



Area of road Parallel to length = $115 \times 2 = 230 \text{ m}^2$

Area of road Parallel to breadth = $64 \times 2.5 = 160 \text{ m}^2$

Area Of cross section of two road = $2 \times 2.5 = 5 \text{ m}^2$

Area of cross roads = $230 + 160 - 5 = 390 - 5 = 385$

Cost of gravelling cross road of at 60 per m² = $385 \times 60 = \text{Rs.23100}$

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9. A rectangle lawn is 43m by 27m has inside path of width 1m parallel to length and 1.5 m parallel to breadth. [161m²]

Area of lawn parallel to its length = $43 \times 27 = 1161 \text{ m}^2$
 Area of lawn parallel to its breadth = $27 \times 1.5 = 40.5 \text{ m}^2$
 Area of cross section = $1 \times 1.5 = 1.5 \text{ m}^2$
 Area of lawn = $1161 + 40.5 - 1.5 = 1200 \text{ m}^2$
 Hence, Area of cross section = 1200 m^2

$$2x^2 + 9x - 11 = 0$$

$$2x^2 + 11 - 2x - 11 = 0$$

$$x(2x + 11) - (2x - 11) = 0$$

$$(2x - 1)(2x + 11) = 0$$

$$2x - 1 = 0 \quad | \quad 2x + 11 = 0$$

$$x = \frac{1}{2} \quad | \quad 2x = -11$$

$$x = -\frac{11}{2}$$

Hence width of verandah = 1 m

10. A room 5m long and 4m wide is surrounded by a verandah. If the verandah occupies an area of 22m². find the Width of veranda? [1 m]

Area of EFHG = $(4 + 2x)(5 + 2x)$
 $= 20 + 8x + 10x + 4x^2$
 $= 20x + 18x + 4x^2$
 Area of verandah = 22
 $20 + 18x + 4x^2 - 20 = 22$
 $2(9x + 2x^2 - 11) = 0$
 $18x + 4x^2 - 22 = 0$
 $2x^2 + 9x - 11 = 0$
 $2x^2 + 11 - 2x - 11 = 0$
 $x(2x + 11) - (2x - 11) = 0$
 $(2x - 1)(2x + 11) = 0$

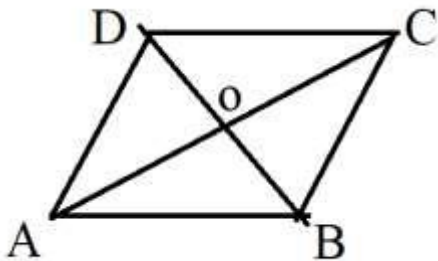
11. A square lawn has 2m wide path surrounding it. If the area of path is 136m². Find the area of lawn? [225m²]

Area of ABCD = $x \times x = x^2$
 Area of EFGH = $(x + 2)(x + 2)$
 $= x^2 + 4x + 4x + 16$
 $= x^2 + 8x + 16$
 Area of path = $x^2 + 8x + 16 - x^2 = 136$
 $8x + 16 = 136$
 $8x = 120$
 $x = 120/8$
 $x = 15$
 Area of lawn = $15 \times 15 = 225 \text{ m}^2$

12. Find area of rhombus one side 15 cm and one diagonal 24cm.

12. $OB^2 = \frac{1}{2} \times 24^2 - 15^2 = 12^2 - 15^2$
 $OB^2 = \sqrt{144 - 225}$
 $OB = \sqrt{81}$
 $OB = 9$
 $OB = 9, AC = 9 \times 2 = 18 \text{ cm}$
 $\text{Area} = \frac{1}{2} \times d_1 \times d_2$
 $= \frac{1}{2} \times 18 \times 24 = 216 \text{ cm}^2 \text{ Area.}$

13. If area of rhombus is 96 m^2 and one of its diagonal is 16cm. find its perimeter?



$AD = d_1 = 16 \text{ cm} \Rightarrow OA = OC = 8 \text{ cm}$
 $\text{Area of rhombus} = \frac{1}{2} d_1 \times d_2 \Rightarrow 96 = \frac{1}{2} \times 16 \times d_2$
 $\Rightarrow d_2 = \frac{96 \times 2}{16} = 12 \text{ cm}$

$BD = 12 \Rightarrow OB = OD = 6$

$\text{Rt. } \Delta AOB, AB^2 = OA^2 + OB^2 = 8^2 + 6^2 = 100$

$\Rightarrow AB = \sqrt{100} = 10 \text{ cm}$

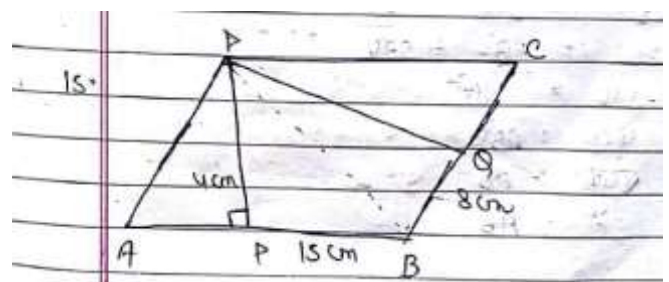
$\text{Perimeter of Rhombus} = 4 \times \text{side} = 4 \times 10 = 40 \text{ cm}$

14. The area of a rhombus is equal to area of a triangle whose base and corresponding height are 24.8cm and 16.5cm respectively. If one of the diagonal of rhombus is 22 cm find other diagonal?

14. $\text{Area of rhombus} = \text{Area of triangle}$
 $\frac{1}{2} \times d_1 \times d_2 = \frac{1}{2} \times b \times h$
 $\frac{1}{2} \times 22 \times d_2 = \frac{1}{2} \times 24.8 \times 16.5$
 $11 \times d_2 = 12.4 \times 16.5$
 $d_2 = \frac{204.6}{11} = 18.6$
 $d_2 = 18.5$
 Hence, the other diagonal = 18.5 cm Area.

Hence, base of parallelogram = $2 \times 16 = 32 \text{ cm}$
 Height " " = 16 cm Area

15. The adjacent side of parallelogram are 15cm and 8 cm. If distance between the longer sides is 4 cm. Find the distance between shorter sides?



$\text{Area } \Delta ADB = \text{Area of } BCB$
 $15 \times 4 = 8 \times x$
 $60 = 8x$
 $60/8 = x$
 $7.5 = x$
 So, $DQ = 7.5 \text{ cm}$

16. The base of parallelogram is twice its height having area 512cm^2 . Find base and height?

16. Let the height = x
 Base = $2x$

Area of parallelogram = base \times height
 $512 = x \times 2x$
 $512 = 2x^2$
 $512/2 = x^2$
 $256 = x^2$
 $\sqrt{256} = x$
 $16 = x$

Hence, base of parallelogram = $2 \times 16 = 32\text{ cm}$
 Height " " = 16 cm

17. Find area of triangle ABC, BC = 24cm, AC = 25cm if $BD \perp AC$ find BD [6.72]

17.

$AC^2 = AB^2 + BC^2$
 $25^2 = AB^2 + 24^2$
 $625 = AB^2 + 576$
 $625 - 576 = AB^2$
 $49 = AB^2$
 $\sqrt{49} = AB$
 $7 = AB$

Ans $\Delta ADB = \frac{1}{2} \times 24 \times 7$

$\Delta BDC = \frac{1}{2} \times 25 \times 7 = \frac{25 \times 7}{2}$

Ans $\Delta ADB = \frac{1}{2} \times 24 \times 7$

$\Delta BDC = \frac{1}{2} \times 25 \times 7 = \frac{25 \times 7}{2}$

18. Find the area and height on longest side of triangle sides 42cm, 34cm and 20cm.

18. $s = \frac{a+b+c}{2} = \frac{42+34+20}{2} = 48$

Area = $\sqrt{s(s-a)(s-b)(s-c)}$
 $= \sqrt{48(48-42)(48-34)(48-20)}$
 $= \sqrt{48 \times 6 \times 14 \times 28}$

$= \sqrt{2 \times 2 \times 2 \times 6 \times 2 \times 2 \times 2 \times 7 \times 7 \times 2 \times 2}$

$= 2 \times 2 \times 2 \times 7 \times 7 \times 2$
 $= 48 \times 7$
 $= 336$

Now, area $\rightarrow \frac{1}{2} \times \text{base} \times \text{height}$

$336 = \frac{1}{2} \times 42 \times h$
 $\frac{2 \times 336}{42} = h$
 $16 = h$

Hence, Height of $\Delta \rightarrow 16$

19. Find area of triangle whose sides are in 13:14:15 and perimeter 84cm

19. P of $\Delta =$ Sum of all sides
 $84 = 13x + 14x + 15x$
 $84 = 42x$
 $84/42 = x$
 $2 = x$

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$$\Rightarrow \begin{aligned} 1^{st} \text{ side} &= 13 \times 2 = 26 \\ 2^{nd} \text{ side} &= 14 \times 2 = 28 \\ 3^{rd} \text{ side} &= 15 \times 2 = 30 \end{aligned}$$

$$\text{semi side} = \frac{a+b+c}{2} = \frac{26+28+30}{2} = \frac{84}{2} = 42$$

$$\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$$

$$= \sqrt{42(42-26)(42-28)(42-30)}$$

$$= \sqrt{42 \times 16 \times 14 \times 12}$$

$$= \sqrt{4 \times 3 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 7 \times 2 \times 2 \times 3 \times 2}$$

$$= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 7 \times 3$$

$$= 48 \times 7 \times 3$$

$$= 1008 \text{ sq. m.}$$

$$\begin{aligned} x^2 &= 90000 \\ x &= \sqrt{90000} \\ x &= 300 \end{aligned}$$

Hence Height = 300 and Base = 900 m.

7th Mensuration Test Paper – 02

1. The area of a rectangular field is 3584 meter square and its length is 64m. A boy runs around the field at the rate of 8 km/h. how long will he take to go 5 times around it.

Ans: Breadth of rectangular field = $\frac{\text{Area}}{\text{length}}$

$$= \frac{3584}{64} = 56$$

Perimeter of rectangular field = $2(56 + 64)$

$$= 2 \times 120 = 240 \text{ m}$$

Distance covered in 5 times running around the field = $240 \times 5 = 12000 \text{ m} = 1.2 \text{ km}$, Speed = 8 km/h

Time = $\frac{\text{Distance}}{\text{speed}} = \frac{1.2}{8} \times 60 \text{ min} = 9 \text{ min}$

2. The area of a square is 16200 meter square. Find the length of its diagonal.

$$\begin{aligned} \text{Area of square} &= \frac{1}{2} \times d^2 \\ 16200 &= \frac{1}{2} \times d^2 \\ 16200 \times 2 &= d^2 \\ 32400 &= d^2 \\ \sqrt{32400} &= d \\ 180 &= d \end{aligned}$$

Hence length of its diagonal = 180 m.

20. The height of an equilateral triangle is $\sqrt{6}$. Find its area.

The height of an equilateral triangle = $\sqrt{6}$

$$= \frac{\sqrt{3}}{2} a = \sqrt{6} \Rightarrow a = \frac{\sqrt{6} \times 2}{\sqrt{3}} = 2\sqrt{2}$$

Area of equilateral triangle = $\frac{\sqrt{3}}{4} a^2 = \frac{\sqrt{3}}{4} (2\sqrt{2})^2$

$$= \frac{\sqrt{3}}{4} \times 8 = 2\sqrt{3}$$

21. The base of a triangular field is three times its height. If the cost of cultivating the field at Rs 1080 per hectare is Rs 14580, find its base and height.

23. Base = $3x$, Height = x

Area = $\frac{1}{2} \times b \times h = \text{Total cost}$

Rate = $\frac{1080 \times 10000}{10000}$

$$\frac{1}{2} \times 3x \times x = 14580$$

$$\frac{3x^2}{2} = 14580 \times 10000$$

$$x^2 = \frac{14580 \times 10000 \times 2}{3}$$

$$x^2 = 97200000$$

$$x = \sqrt{97200000} = 9810$$

Base = $3 \times 9810 = 29430$

Height = 9810