

$$\frac{1}{10} = \frac{M \times 10 \times 3}{10}$$

$$M = \frac{100}{3} = 33.33$$

$$140 - 60 = 80 \text{ men}$$

$$30\% = \frac{30}{100}$$

$$70\% = \frac{70}{100}$$

A tank has oxygen for 72 patients and can last for 54 hours. If patients reduce their oxygen consumption by 10%, then 90% can use this oxygen.

$$72 \times 54 = \frac{90 \times 90 \times P}{100} \times 1$$

$$P = 48 \text{ hrs}$$

$$\frac{1 \text{ hr}}{1 \text{ Patient}} = \frac{P \text{ hr}}{72 \text{ P}}$$

$$72 \times 54$$

$$-10\%$$

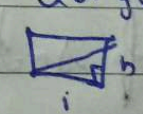
$$90\% \times P = \frac{90P}{100}$$

Area & Perimeter

Area - amount of space occupied by 2d figure.

Rectangle $l \times b = \text{Area}$ Perimeter $= 2(l+b)$ Longest path $=$

$$d^2 = l^2 + b^2 \quad d = \sqrt{l^2 + b^2}$$



Square

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

$$\text{Perimeter} = 4a$$

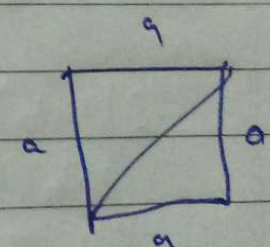
Area \propto side²

P \propto side

a	2a	3a
a ²	4a ²	9a ²
4a	8a	12a

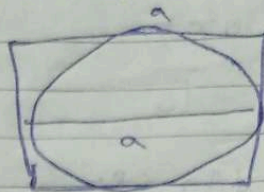
Area

Perimeter

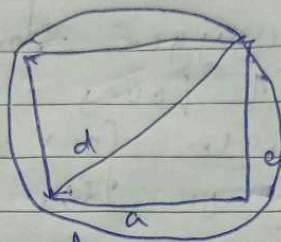


$$\text{area} = \frac{1}{2} d^2$$

Incircle & Circum Circle



$$a = \text{diameter} \quad r = \frac{a}{2}, \quad A = \pi r^2, \quad \frac{\pi a^2}{4}$$



diameter = diagonal
 $\sqrt{2}a$

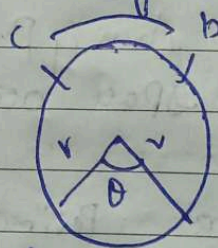
$$r = \frac{\sqrt{2}a}{2} = \frac{a}{\sqrt{2}}$$

$$A = \pi r^2$$

$$\pi a^2 / 2$$

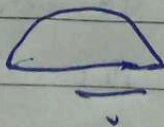
Circle & Semi Circle

$$\text{Area} = \pi r^2, \quad \text{Circumference} = 2\pi r$$



$$\text{length of arc} = 2\pi r \theta / 360$$

$$\text{Area of sector} = \frac{1}{2} * \text{arc length} * r = \pi r^2 \theta / 360$$



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

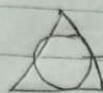
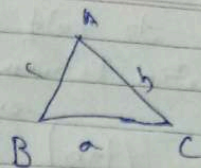
$$\text{Circumference} = 2\pi r$$

$$\text{Perimeter} = \pi r + 2r$$

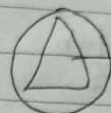
Triangle

$$\text{Area} = \frac{1}{2} ab \sin C$$

$$A = ca \left(\frac{\sqrt{3}}{2} \right) = (\sqrt{3}/4) * (\text{side})^2$$



$$\text{In Circle } r = \frac{a}{2\sqrt{3}}$$



$$\text{Circum Circle } r = \frac{a}{\sqrt{3}}$$

- 1.) The length of a rectangle is increased by 40% and breadth is decreased by 40%. What will be change in area.

By what percent should be breadth increased to maintain same Area if decrease in length is 40%.

$$\frac{140}{100} l \times \frac{60}{100} b = \frac{140}{100} \times \frac{60}{100} \times lb$$

$$\frac{84}{100} \text{ of } A$$

$$16\% \text{ of } A$$

$$\text{ii.) } 60\% \text{ of } l \times b = lb$$

$$\frac{60}{100} l \times B = lb$$

$$B = \frac{100}{60} lb \quad 1.6 \text{ times of } b$$

$$1.5 = 50, \text{ then } 1.6 = 60$$

$$\text{so } 60\% \uparrow b$$

- 2.) Ram was in a hurry to catch a bus so rather than walking from A to B and then from B to C along given rectangular path, he decided to take a shortcut. This saved his distance what way

equal to half of the length of longer side.
find ratio between longer & shorter side

$$(1+b) - \sqrt{1^2+b^2} = \frac{1}{2}$$

original length shorter

$$\frac{1+b}{2} = \sqrt{1+b^2}$$

$$Ab = 31$$

$$\frac{1}{b} = 4:3$$

- 3) How many minimum number of square tiles are needed to cover a rectangular floor of dimension 5.15 m and 5.10 m

$$l = 5.15 \quad b = 5.10$$

Take grid

$$5 = 15$$

$$\frac{\text{Area of rectangl}}{\text{Area of sq}} = \frac{515 \times 510}{15^2}$$

$$\begin{array}{r} 5 \overline{) 515 \ 510} \\ 3 \overline{) 105 \ 105} \end{array}$$

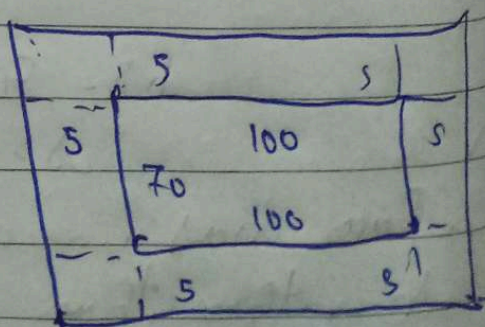
1190 tiles

- 4.) The perimeter of a rectangular garden of length 100m is 340m. A flower bed 5 meter is built around it. A gardener works for 2 days on this flower and charges 8 / m² sq meter. His fixed charges per day is Rs 300/- what will the total paid on completion or on

$$2(1+b) = 3000$$

$$1+b = 170$$

$$b = 70$$



$$l_1 = 110 \text{ m} = 100 + 5 + 5$$

$$b_1 = 70 + 50 + 5 = 80$$

$$A_0 - A_1 = 1800 \text{ m}^2$$

$$1800 \times 5 = 14400$$

$$A_1 = 100 \times 70 = 7000$$

$$A_0 = 110 \times 80 = 8800$$

$$14400 \div (30 \times 1) = 15,000 \text{ kg}$$

Daily wage

- 5) A rectangular garden 100m by 80m has 2 mutually perpendicular foot paths running through centre. one foot path runs across the length while the second one runs across the breadth. The width of both the paths is 10m find the gravel at ₹ 35 per sq meter

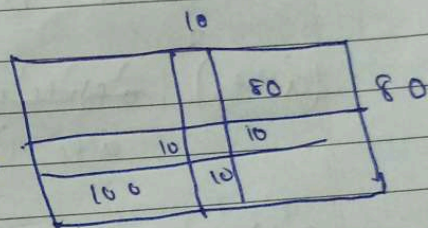
$$① - 10 \times 80 = 800 \text{ m}^2$$

$$2 - 100 \times 10 = 1000 \text{ m}^2$$

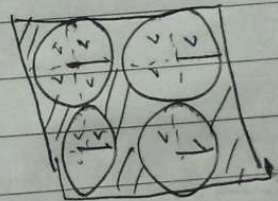
we add area twice remove

$$10 \times 10 = 100 \text{ m}^2$$

$$1700 \text{ m}^2 \times 5 = 8500 \text{ Rs}$$



- 6) find the area of shaded portion of given figure $r = 7 \text{ cm}$



$$A_{sq} = 16^2 = 16 \text{ cm}^2$$

$$A_{circ} = 4 \times \pi r^2 = 4 \times \pi \times 7^2$$

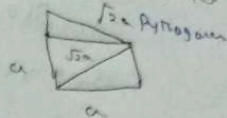
$$A_{sq} - A_{circ} = 16^2 - 4 \times \pi \times 7^2$$

$$16 \text{ cm}^2$$

- f) An equilateral Δ is drawn on diagonal of square of side a .
what is the relation between the areas of triangle and square.

$$A_{sq} = a^2 \quad A_{\Delta} = \frac{\sqrt{3}}{4} (s)^2 = \frac{\sqrt{3}}{4} (\sqrt{2}a)^2 = \frac{\sqrt{3}}{2} a^2$$

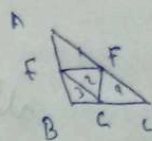
$$\frac{A_{\Delta}}{A_{sq}} = \frac{\sqrt{3}}{2}$$



- g) The sides of triangle are 3cm, 4cm, 5cm. find the area and perimeter of triangle formed by joining the mid points of 3 sides of original triangle.

find whether its right angle.
 $h^2 = b^2 + c^2 \quad 5^2 = 3^2 + 4^2 = 25 = 25$

Totally 4 triangles



The length of EF will be $\frac{EF}{2} = BC \sin A$

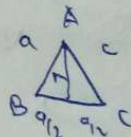
Perpendicular

$$A = \frac{1}{2} \times b \times h = \frac{1}{2} \times 3 \times 4 = 6 \text{ cm}^2 = A_{ABC}$$

$$EFG = \frac{6}{4} \text{ cm}^2 = \frac{3}{2} \text{ cm}^2$$

$$\frac{3}{2} + \frac{4}{2} + \frac{5}{2} \text{ (Perimeter)} = \frac{3+4+5}{2} = \frac{12}{2} = 6 \text{ cm} = \text{Perimeter}$$

- 9) If the length of median of equilateral triangle is m find its Area.



$$\Delta ABD \rightarrow R + \angle A$$

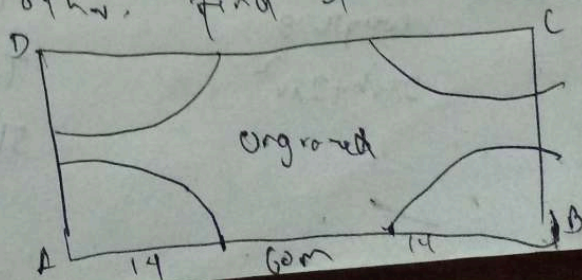
$$a^2 = \left(\frac{a}{2}\right)^2 + m^2$$

$$\Delta ABC = \frac{\sqrt{3}}{4} a^2$$

$$m^2 = \frac{3}{4} a^2$$

$$\frac{\sqrt{3} m^2}{3} = \frac{m^2}{\sqrt{3}}$$

- 10) Four houses are tied with the help of a 14m rope, at the corners of a rectangular field 60m x 45m. The horses can't reach others. find the area left ungrazed.



$$\text{Sector} = \frac{\pi r^2 \theta}{360} = \frac{22}{7} \times 14 \times 14 \times \frac{90}{360} = 154 \text{ m}^2$$

$$S_1 + S_2 + S_3 + S_4 = 4 \times 154 = 616 \text{ m}^2$$

$$\text{Total area} = 60 \times 45 = 2700 \text{ m}^2$$

$$2700 - 616 = 2084 \text{ m}^2$$

Volume &

Surfaces

make sure to go through

all important formulae

Cube

Cuboid

No. of sides

12

12

No. of faces

6

6

No. of vertices

8

8

Diagonal

$\sqrt{3}a$

$\sqrt{l^2 + b^2 + h^2}$