Measurement Of Angles Ex 4.1 Q3

Let θ_1 and θ_2 be two acute angles of a right angled triangle.

$\therefore$ difference of acute angles

$$\theta_1 - \theta_2 = \frac{2\pi}{5} \text{ radians}$$

$\because$ in a right angled triangle,

$$\theta_1 + \theta_2 = \frac{\pi}{2}$$

$$\theta_1 - \theta_2 = \frac{2\pi}{5} \qquad \text{---(i)}$$

$$\theta_1 + \theta_2 = \frac{\pi}{2} \qquad \text{---(ii)}$$

On solving

$$2\theta_1 = \frac{2\pi}{5} + \frac{\pi}{2}$$

$$\theta_1 = \frac{9\pi}{20}$$

From equation (ii)

$$\theta_2 = \frac{\pi}{20}$$

So angles in degrees

$$\theta_1 = \frac{9\pi}{20} \times \frac{180}{\pi} = 81^\circ$$

and $$\theta_2 = \frac{\pi}{20} \times \frac{180}{\pi} = 9^\circ$$

Measurement Of Angles Ex 4.1 Q4

Let θ_1 and θ_2 and θ_3 be the angle or triangle.

$$\theta_1 = \frac{2}{3}x \text{ gradiants}$$

$$\theta_2 = \frac{3}{2}x \text{ degrees and}$$

$$\theta_3 = \frac{\pi x}{75}x \text{ radians}$$

Now,

we have to express all the angles in degrees

$$\therefore \quad \theta_1 = \left(\frac{3}{2}x \times \frac{90}{100}\right)^0$$

$$= \frac{3}{5}x \qquad \left[1g = \frac{90}{100} \text{ degree}\right]$$

$$\theta_2 = \frac{3}{2}x^0$$

$$\theta_2 = \frac{\pi x}{75} \times \frac{180}{\pi} = \frac{12x}{5}$$

By angleslam property,

$$\theta_1 + \theta_2 + \theta_3 = 180°$$

$$\therefore \quad \frac{3}{5}x° + \frac{3}{2}x^0 + \frac{12x}{5} = 180°$$

$$\Rightarrow \quad \frac{9}{2}x^0 = 180^0$$

$$\Rightarrow \quad x = 40^0$$

$$\therefore \quad \theta_1 = 24^0, \ \theta_2 = 60^0, \ \theta_3 = 96^0$$

Measurement Of Angles Ex 4.1 Q5

General formula for interior angles of polygon with n side

$$= \left(\frac{2n-4}{n}\right) \times 90^0$$

(i) Pentagon has 5 sides

$\therefore$ magnitude of the interior angle

$$= \frac{2 \times 5 - 4}{5} \times 90^0$$

$$= \frac{6}{5} \times 90 = \quad 180^0$$

Now,

$$\because \quad 1^c = \frac{180}{\pi}$$

And each angle of Pentagon

$$= \frac{2 \times 5 - 4}{5} \times \frac{\pi}{2}$$

$$= \left(\frac{3\pi}{5}\right)^c$$

$$\therefore \quad 108°, \ \left(\frac{3\pi}{5}\right)^c$$

(ii) Octagon

$$n = 8$$

$$\therefore \text{ each angle} = \frac{2 \times 8 - 4}{8} \times 90^0$$

$$= 135^0$$

Again,

$$\text{each angle} = \frac{2 \times 8 - 4}{8} \times \frac{\pi}{2}$$

$$= \left(\frac{3\pi}{4}\right)^c$$

$$\therefore \quad 135^0, \ \left(\frac{3\pi}{4}\right)^c$$

(iii) Heptagon

$$n = 7$$

$$\therefore \text{ each angle} = \frac{2 \times 7 - 4}{7} \times 90^0$$

$$= \frac{10}{7} \times 90^0$$

$$= \frac{900^0}{7}$$

$$= 128^0 34^I 17^{II}$$

Again,

$$\text{each angle} = \frac{2 \times 7 - 4}{7} \times \frac{\pi}{2}$$

$$= \frac{10}{7} \times \frac{\pi}{2}$$

$$= \left(\frac{5\pi}{7}\right)^c$$

$$\therefore \ 128^0 34^I 17^{II}, \ \left(\frac{5\pi}{7}\right)^c$$

(iv) Duodecagon

$$n = 12$$

$$\therefore \text{ each angle} = \frac{2 \times 12 - 4}{12} \times 90^0$$

$$= \frac{20}{12} \times 90^0$$

$$= 150^0$$

Agian,

$$\text{each angle} = \frac{2 \times 12 - 4}{12} \times \frac{\pi}{2}$$

$$= \frac{20}{12} \times \frac{\pi}{2}$$

$$= \left(\frac{5\pi}{6}\right)^c$$

$$\therefore \ 150^0, \ \left(\frac{5\pi}{6}\right)^c$$

*********** END **********