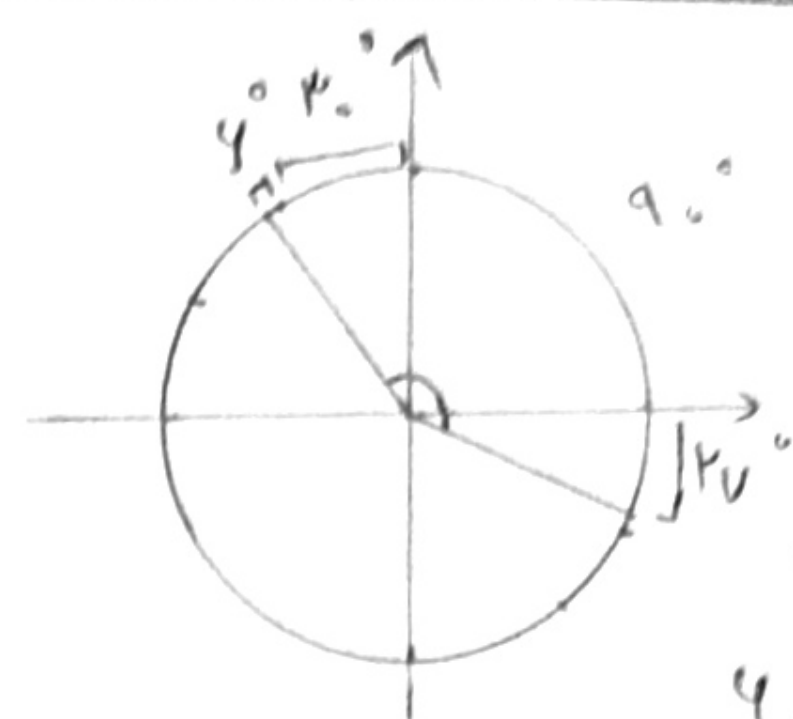


$$|\omega, \omega M - \omega_0 H| =$$

$$|\omega, \omega \times \omega r - \omega_0 \times \omega| = 29V - 9^\circ = 10V^\circ$$

$$104^\circ - 1V^\circ = 103^\circ$$

(ب)



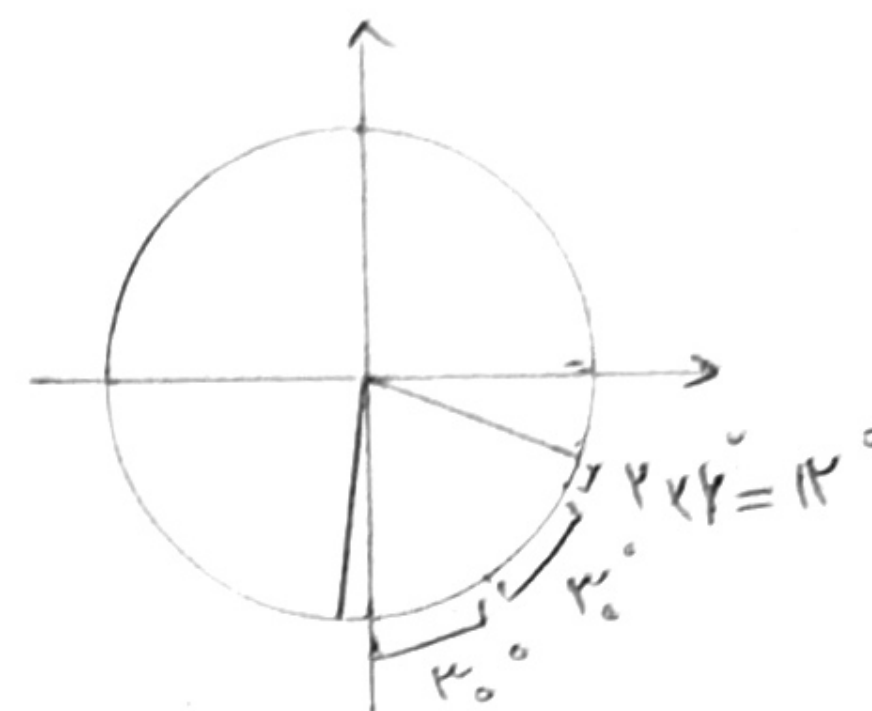
$$9 + 27 + 90 + 27 = 153^\circ$$

(الف)

$$|\omega, \omega M - \omega_0 H| = |\omega, \omega \times 11 - \omega_0 \times 4| =$$

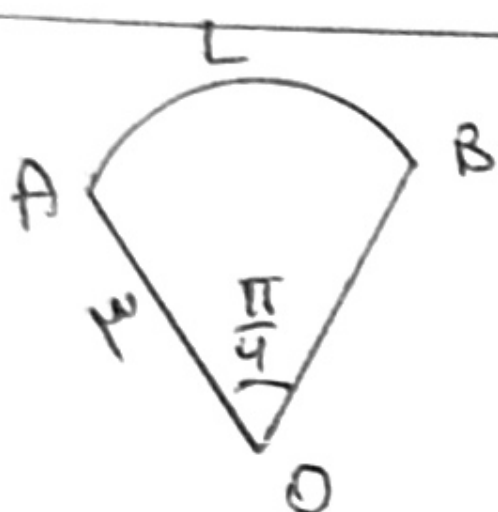
$$|99 - 44| = 55$$

(ب)



$$H = \frac{11}{2} = 5.5 \quad 9 + 12 + 30 + 12 = 63$$

(الف)



$$L = R \times \alpha = r \times \frac{\pi}{4} = \frac{\pi r}{4}$$

$$\frac{1}{r} = r + r + \frac{\pi}{4} = 4 + \frac{\pi}{4} \text{ cm}$$

(ب)

$$S = \frac{\alpha}{2} \times R^2$$

$$\frac{\pi}{4} \times \frac{1}{2} \times r^2 = \frac{\pi r^2}{8} \text{ cm}^2$$

(الف)

$$c = \sqrt{a^2 + b^2 - 2ab \cos \alpha}$$

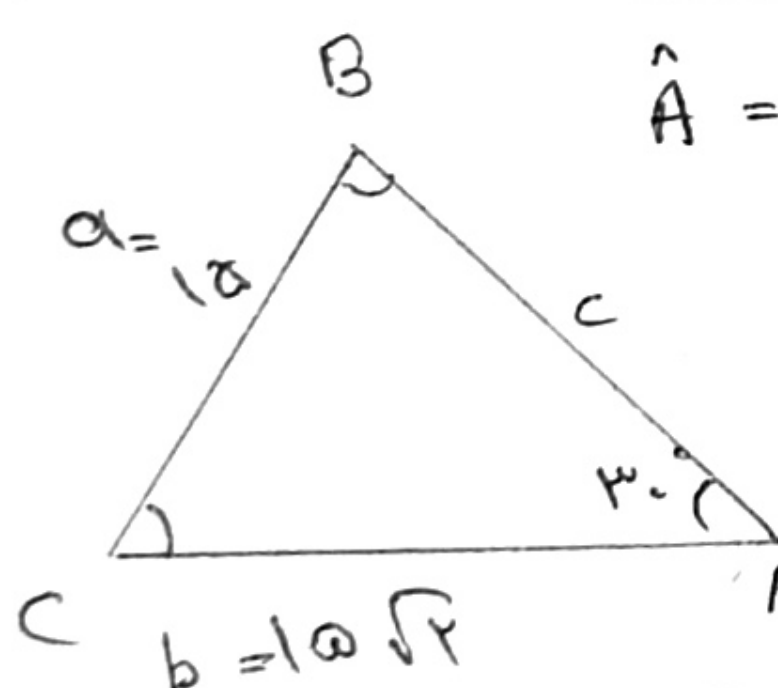
$$= \sqrt{5^2 + 1^2 - 2 \times 5 \times 1 \times \frac{1}{2}} = \sqrt{25 + 1 - 5} = \sqrt{21} = 4.58$$

$$\frac{1}{r} = 5 + 1 + 1 = 7$$

(ب)

$$\frac{1}{2} ab \sin \alpha = \frac{1}{2} \times 5 \times 1 \times \frac{\sqrt{3}}{2} = 2.5 \sqrt{3}$$

(الف)



$$\hat{A} = 180^\circ - (\hat{B} + \hat{C}) = 60^\circ$$

$$\frac{a}{\sin \hat{A}} = \frac{b}{\sin \hat{B}} \rightarrow \frac{10}{\frac{1}{2}} = \frac{10\sqrt{2}}{\sin \hat{B}}$$

$$\sin \hat{B} = \frac{10 \times \frac{1}{2} \times \frac{1}{2}}{10} = \frac{1}{2} \rightarrow \hat{B} = 30^\circ$$

(الف)

$$\hat{C} = 180^\circ - 60^\circ - 30^\circ = 90^\circ \rightarrow \frac{10}{10} = \frac{R \sin 90^\circ}{10} \Rightarrow \frac{10}{10} = \frac{R}{10} \Rightarrow R = 10$$

$$\frac{10}{10} = \frac{R \sin 90^\circ}{10} \rightarrow R \sin 90^\circ = 10$$

$$\frac{\tan(\pi - \alpha) + \tan(\pi + \alpha)}{\tan(\pi - \alpha) - \tan(\pi + \alpha)} = \frac{-\tan \alpha + \tan \alpha}{-\tan \alpha - \tan \alpha} = \frac{0}{-2 \tan \alpha} = 0$$

(الف)

$$\frac{r \tan 10^\circ + \tan 10^\circ}{r \tan 10^\circ - \tan 10^\circ} = \frac{r \tan(10^\circ - 10^\circ) + \tan(10^\circ + 10^\circ)}{r \tan(110^\circ - 10^\circ) - \tan(110^\circ + 10^\circ)} = \frac{r \cot 10^\circ - \cot 10^\circ}{-r \cot 10^\circ - \cot 10^\circ} = \frac{\cot 10^\circ}{-r \cot 10^\circ} = -\frac{1}{r}$$

(الف)

$$\frac{\sin x + \cos x}{\sin x - \cos x} + \frac{\sin x - \cos x}{\sin x + \cos x} = 1^0$$

$$\frac{\sin^2 x + \cos^2 x + \cancel{\sin x \cos x} + \sin^2 x + \cos^2 x - \cancel{\cos x \sin x}}{\sin^2 x - \cos^2 x} = \frac{r(\sin^2 x + \cos^2 x)}{\sin^2 x - \cos^2 x} = r$$

$$\frac{r}{\sin^2 x - \cos^2 x} = r \rightarrow \sin^2 x - \cos^2 x = \frac{r}{r}$$

$$\tan^2 x \cos^2 x - \cos^2 x = \frac{r}{r}$$

$$\cos^2 x (\tan^2 x - 1) = \frac{r}{r}$$

$$\frac{1}{1 + \tan^2 x} (\tan^2 x - 1) = \frac{r}{r}$$

$$\tan^2 x - 1 = \frac{r}{r} (1 + \tan^2 x)$$

$$-r + r \tan^2 x = r + r \tan^2 x \quad \tan^2 x = r + r = 2$$

$$\frac{\sin^2 x - r \cos^2 x + 1}{\sin^2 x + r \cos^2 x - 1} = r$$

$$\sin^2 x + r \cos^2 x - 1$$

$$\frac{\sin^2 x - r \cos^2 x + \sin^2 x + \cos^2 x}{\sin^2 x + r \cos^2 x - \sin^2 x - \cos^2 x} = \frac{r \sin^2 x - r \cos^2 x}{\cos^2 x} = r$$

$$r \cos^2 x = r \sin^2 x - r \cos^2 x$$

$$\sin^2 x = \frac{2}{r} \cos^2 x$$

$$\tan^2 x = \frac{\sin^2 x}{\cos^2 x} = \frac{\frac{2}{r} \cos^2 x}{\cos^2 x} = \frac{2}{r}$$

$$\cos(r, \omega) \Rightarrow \cos^2 x = \frac{1 + \cos 2x}{2}$$

$$\cos^2(r, \omega) = \frac{1 + \cos 2x}{2} = \frac{1 + \frac{\sqrt{r}}{r}}{2} = \frac{\frac{r + \sqrt{r}}{r}}{2} = \frac{r + \sqrt{r}}{2r}$$

$$\cos(r, \omega) = \pm \sqrt{\frac{r + \sqrt{r}}{2r}} = \pm \frac{\sqrt{r + \sqrt{r}}}{\sqrt{2r}}$$

$$\sin(r, \omega) \Rightarrow \sin^2 x = \frac{1 - \cos 2x}{2}$$

$$\sin^2(r, \omega) = \frac{1 - \cos 2x}{2} = \frac{1 - (-\frac{\sqrt{r}}{r})}{2} = \frac{1 + \frac{\sqrt{r}}{r}}{2} = \frac{\frac{r + \sqrt{r}}{r}}{2} = \frac{r + \sqrt{r}}{2r}$$

$$\sin(r, \omega) = \pm \sqrt{\frac{r + \sqrt{r}}{2r}} \Rightarrow \pm \frac{\sqrt{r + \sqrt{r}}}{\sqrt{2r}}$$