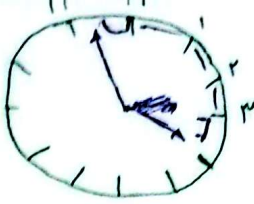


الف)



$$3 \times 30 + \frac{30}{4} + 4 \times 4 = 90 + 7.5 + 16 = 113.5 \quad \checkmark \quad 14 \text{ دقيقة}$$

من مروج قبل ان

$$b) |\omega/\omega \times \omega/4 - 30 \times 3| = \alpha \Rightarrow \alpha = 30 \times \frac{113.5}{360} = 10.3 \quad \checkmark$$

2

الف)



$$3 \times 30 + \frac{11}{4} + 11 = 111.25 \quad \checkmark$$

2

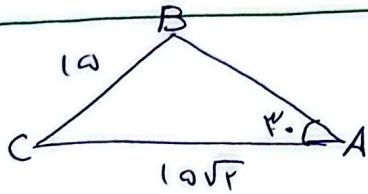
$$b) |\omega/\omega \times 11 - 30 \times 4| = \alpha \Rightarrow \alpha = |11 - 120| = 109 \quad \checkmark$$

$$الف) S = \frac{\alpha}{r} R^2 = \frac{\pi}{14} \times r^2 = \frac{4\pi}{14} = \frac{2\pi}{7} \quad \checkmark, \quad \underline{b) = aR^2 + 2R} = \frac{\pi}{4} \times r^2 + 4 = \frac{\pi}{4} + 4 \quad \checkmark \quad 1.5$$

$$s = \frac{1}{4} \times \frac{\sqrt{3}}{4} \times 1 \times \omega = 10\sqrt{3} \quad \checkmark, \quad CB = \sqrt{1^2 + \omega^2} = \sqrt{1 + \omega^2} = \sqrt{1 + 9} = \sqrt{10} = V$$

$$P = 1 + V + \omega = 20 \quad \checkmark$$

2



$$\frac{a}{\sin A} = \frac{b}{\sin B} \Rightarrow \frac{10}{\sin A} = \frac{10\sqrt{3}}{\sin B} \Rightarrow \sin B = \frac{\sqrt{3}}{2} \Rightarrow B = 60^\circ$$

$$\Rightarrow C = 180 - 60 - 60 = 60^\circ = \frac{\pi}{3} + \frac{\pi}{3} = \frac{2\pi}{3} \quad \checkmark$$

$$C = \frac{2\pi}{3} \quad B = \frac{\pi}{3} \quad \checkmark$$

$$C' = 1.5 \times \frac{\pi}{4} = \frac{3\pi}{8} \quad \checkmark \quad 1.5$$

$$\frac{\tan(\pi - \alpha) + r \tan(\pi + \alpha)}{\tan(r\pi - \alpha) - \tan(r\pi + \alpha)} = \frac{-\tan \alpha + r \tan \alpha}{-\tan \alpha - \tan \alpha} = \frac{r \tan \alpha}{-2 \tan \alpha} = -\frac{r}{2} \quad \checkmark$$

2

$$\tan \frac{\pi}{4} = \tan 45^\circ = 1 \Rightarrow \cot 15^\circ = \frac{1}{\tan 15^\circ}$$

$$\frac{r \tan 45^\circ + \tan 10^\circ}{r \tan 145^\circ - \tan 140^\circ} = \frac{r \tan(\frac{\pi}{4} - 10^\circ) + \tan(\frac{\pi}{4} + 10^\circ)}{r \tan(\pi - 10^\circ) - \tan(\frac{3\pi}{4} - 10^\circ)}$$

$$= \frac{r \cot 15^\circ - \cot 15^\circ}{-r \tan 15^\circ - \cot 15^\circ} = \frac{\cot 15^\circ}{-r \tan 15^\circ - \cot 15^\circ} = \frac{1}{-r \tan 15^\circ - \cot 15^\circ} = \frac{1}{-r \tan 15^\circ - \frac{1}{\tan 15^\circ}} = \frac{1}{\frac{-r \tan^2 15^\circ - 1}{\tan 15^\circ}} = \frac{\tan 15^\circ}{-r \tan^2 15^\circ - 1}$$

1.5

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

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

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

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

$$\Rightarrow \tan^2 x = \frac{\sin^2 x}{\cos^2 x} = \frac{\frac{1}{r}}{\frac{1}{r}} = 1 \quad \checkmark$$

(Y)

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

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

$$\Rightarrow \tan^2 x = \frac{2 \cos^2 x}{\cos^2 x} = \frac{2}{1} = 2 \quad \checkmark$$

(Y)

$$\text{الف) } \cos \frac{\theta}{r} = \sqrt{\frac{1 + \frac{\sqrt{r}}{r}}{r}} \longrightarrow \cos \frac{\theta}{r} = \sqrt{\frac{1 + \cos \theta}{r}}$$

$$\text{ب) } \sin \frac{\theta}{r} = \sqrt{\frac{1 - \frac{\sqrt{r}}{r}}{r}} \longrightarrow \sin \frac{\theta}{r} = \sqrt{\frac{1 - \cos \theta}{r}}$$

(Y)