

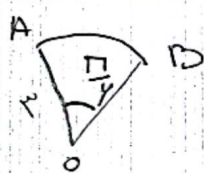
الف) ۳:۴۵
 ۱۲۰ = ۳۶۰ - ۲۴۰ = ۱۲۰
 $120 + 27 + 9 = 156^\circ$

 $\frac{d\theta}{dt} = 27$

$\alpha = |d\theta/dt - 2\pi/h| = |(d\theta/dt \times 60) - (2\pi \times 60)| = 207 \Rightarrow 360 - 207 = 153^\circ$

الف) ۴:۱۸
 $120 + 30 + 30 + 9 = 189$

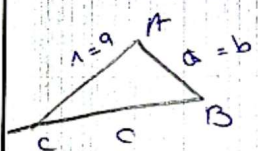
 $4 \times 4 = 12$
 $\frac{1}{4} = 9$
 $\alpha = |d\theta/dt - 2\pi/h| = |(d\theta/dt \times 18) - (2\pi \times 18)| = 181$



$S = \frac{1}{2} \alpha \times R^2 \rightarrow \frac{17}{2} \times 9 = \frac{\pi}{2} \times 9 = \frac{9\pi}{2} = \frac{3\pi}{2}$ مساحت قطاع

$L = R\alpha \rightarrow 3 \times \frac{\pi}{2} = \frac{3\pi}{2} = \frac{\pi}{2}$

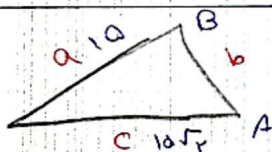
$P = 3 + 3 + \frac{\pi}{2} = 6 + \frac{\pi}{2}$ مساحت قطاع



$S = \frac{1}{2} ab \sin \alpha = \frac{1}{2} \times 9 \times 8 \times \sin 70^\circ = \frac{1}{2} \times 9 \times 8 \times \frac{\sqrt{3}}{2}$
 $= \frac{36\sqrt{3}}{2} = 18\sqrt{3}$ مساحت مثلث

$c^2 = a^2 + b^2 - 2ab \cos \alpha \Rightarrow c^2 = 9^2 + 8^2 - 2 \times 9 \times 8 \times \cos 70^\circ =$
 $81 + 64 - 144 \times \frac{1}{2} = 145 - 72 = 73$
 $c = \sqrt{73} = 8.54$

$\rightarrow p = a + b + c = 20 \rightarrow$ محیط



$B + C = 180^\circ$
 $Ac = 10\sqrt{2}$
 $Bc = 10$
 $A = 180^\circ - 120^\circ = 60^\circ$

$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

$\frac{10}{\sin 60^\circ} = \frac{10\sqrt{2}}{\sin B} = \frac{10}{\sin C} = \frac{10\sqrt{2}}{\sin B}$

$\sin B = \frac{10\sqrt{2}}{10} = \frac{\sqrt{2}}{2} = \frac{1}{\sqrt{2}}$

$B = 45^\circ$
 $C = 120^\circ$

$\frac{Rad}{\pi} = \frac{D}{180^\circ} \rightarrow \frac{B^\circ Rad}{\pi} = \frac{45}{180}$
 $\rightarrow Rad = \frac{\pi}{4} = B$
 $c = \frac{Rad}{\pi} = \frac{100}{180} = \frac{5\pi}{9} = c$

$$\frac{\tan(\pi - \alpha) + r \tan(\alpha + \pi)}{\tan(r\pi - \alpha) - \tan(\pi + \alpha)} = \frac{-\tan \alpha - r \tan \alpha}{-\tan \alpha - \tan \alpha} = \frac{r \tan \alpha}{-r \tan \alpha} = -1 \quad \checkmark$$

Y

$$\tan \alpha = \frac{\pi}{r} = \alpha \quad \text{Let } \alpha = \alpha$$

$$A = \frac{r \tan \alpha + \tan 10^\circ}{r \tan 12^\circ - \tan 10^\circ} = \frac{r \tan(\frac{\pi}{r} - 10^\circ) + \tan(\frac{\pi}{r} + 10^\circ)}{r \tan(\pi - 10^\circ) - \tan(\frac{\pi}{r} - 10^\circ)}$$

$$\frac{r \cot 10^\circ - \cot 10^\circ}{-r \tan 10^\circ - \cot 10^\circ} = \frac{\frac{1}{\alpha}}{-\alpha - \frac{1}{\alpha}} = \frac{-1}{r\alpha + 1} \quad \checkmark$$

Y

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

$$\tan^2 x = ? \quad \frac{(\sin x + \cos x)^2 + (\sin x - \cos x)^2}{\sin^2 x - \cos^2 x} = \frac{\sin^2 x + \cos^2 x + \sin^2 x + \cos^2 x + \sin^2 x - \cos^2 x - \sin^2 x + \cos^2 x}{\sin^2 x - \cos^2 x}$$

Y

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

$$1 + \tan^2 x = \frac{1}{\cos^2 x} \quad \checkmark \quad \cos^2 x = \frac{1}{r} \rightarrow \tan^2 x = 0$$

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

$$\sin^2 x + r \cos^2 x - 1 = (1 - \cos^2 x) + r \cos^2 x - 1 = \cos^2 x$$

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

$$1 + \tan^2 x = \frac{1}{\cos^2 x} \rightarrow \tan^2 x = \frac{1}{\cos^2 x} - 1 = \frac{1 - \cos^2 x}{\cos^2 x} = \frac{\sin^2 x}{\cos^2 x} = \tan^2 x \quad \checkmark$$

Y

$$\cos(2\pi/a) \rightarrow \cos^2 x = \frac{1 + \cos 2x}{2} \rightarrow \cos^2 2\pi/a = \frac{1 + \cos 4\pi/a}{2}$$

$$\cos^2 2\pi/a = \frac{1 + \sqrt{r}}{2} \rightarrow \cos 2\pi/a = \pm \sqrt{\frac{1 + \sqrt{r}}{2}} = \sqrt{\frac{1 + \sqrt{r}}{2}} = \frac{1 + \sqrt{r}}{2} \quad \checkmark$$

$$\sin(2\pi/a) = \cos(2\pi/a) = \frac{1 + \sqrt{r}}{2} \quad \checkmark$$

Y