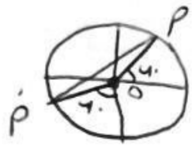
 ۲۰

پارمیس شیرازی

1) $\frac{a\times(-\frac{\sqrt3}{2})+b\times(-\frac{\sqrt3}{2})}{a\times(-\frac12)+b\times(\frac12)} = \frac{-\frac{\sqrt3}{2}(a+b)}{-\frac12(a-b)} \Rightarrow \sqrt3(\frac{a+b}{a-b}) = -\frac{\sqrt3}{3} \Rightarrow \frac{a+b}{a-b}=-\frac13 \Rightarrow \frac{b-a=3a+3b}{-4a=2b}$ ۲

$-2a=b \Rightarrow -2=\frac{b}{a}$

2) $P(\frac12,\frac{\sqrt3}{2}) \Rightarrow$  $\Rightarrow$  $\Rightarrow 270-120=150 \to$  $\Rightarrow PP'=\sqrt{2+\sqrt3}$ ۲

$\cos150=-\frac{\sqrt3}{2}$

محیط $=2+\sqrt{2+\sqrt3}$

3) $\to \frac{\pi}{9} \Rightarrow \frac{D}{180}=\frac{R}{\pi} \Rightarrow \frac{\pi}{9\times\pi}=\frac{D}{180} \Rightarrow D=\frac{180}{9}=20 \to \frac{360}{12}=30) \to$ ساعت $\Rightarrow \boxed{\frac23 \text{ ساعت}}$ ۲

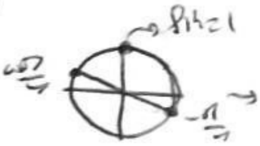
۳۰

$\Rightarrow \frac23\times60=40\,min \Rightarrow$ ۲:۴۰

4) $\Rightarrow$ زاویه $=|\frac{11M}{2}-30h| \to \frac{11M}{2}-90=20 \Rightarrow \frac{11M}{2}=110 \Rightarrow M=20 \to 20>\frac{140}{11} \Rightarrow 20$ [illegible]

min

$90-\frac{11M}{2}=20 \Rightarrow \frac{11M}{2}=70 \Rightarrow \cancel{M=\frac{140}{11}}$ ۲

5)  $(-\frac12,1] \Rightarrow -\frac12<\frac{m-3}{5}\le1 \Rightarrow -\frac52<\bigcirc\le5 \xrightarrow{+3} \frac12<\bigcirc\le8$ ۲

$m\in(\frac12,8] \Rightarrow$

6) $\frac{\sin(\frac{\pi}{2}+15)+k\cos(\frac{3\pi}{2}-15)}{\cos(\pi-15)+2\sin(\pi+15)} = \frac{\cos15-k\sin15}{-\cos15-2\sin15} = \frac{k\sin15-\cos15}{2\sin15+\cos15} \Rightarrow \tan15=\frac14 \to \frac{\sin}{\cos}=\frac14$

$\frac{k(1)-4}{2(1)+4}=\frac{k-4}{6}=3 \to k-4=18 \to k=22$ ۲

۷) $\frac{\cot x + \cot x}{\tan x - ۲\tan x} = \frac{۲\cot x}{-\tan x}$ → $۲ + ۲\cos = ۱ - \cos \Rightarrow ۳\cos = -۱ \to \cos = \frac{-۱}{۳} \Rightarrow \sin^۲ = ۱ - \frac{۱}{۹} = \frac{۸}{۹}$

$\frac{۲ \times \frac{\cos}{\sin}}{-\frac{\sin}{\cos}} = \frac{-۲\cos^۲ x}{\sin^۲ x}$ → $\frac{-۲\left(\frac{۱}{۹}\right)}{\frac{۸}{۹}} = -\frac{۱}{۴}$

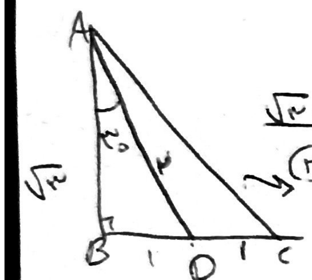
۲

۸) $\Rightarrow ۱۰۸ \times \frac{\pi}{۱۸۰} = \frac{۳\pi}{۵} \Rightarrow L = \frac{۳\pi}{۵} R$

$L' = \alpha R' = \frac{۹\pi}{۱۰} \alpha R'$ $\Rightarrow \frac{۳\pi}{۵} R = \frac{۹\pi}{۱۰} R' \Rightarrow ۲R = ۳R' \Rightarrow \frac{S_A}{S_B} = \frac{۹\pi^۲}{۴\pi^۲} = \frac{۹}{۴}$

۲

۹)



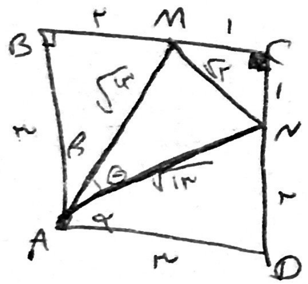
$\frac{\sqrt{۳} \times ?}{۲} = \sqrt{۳} \Rightarrow BC = ۲ \to DC = ۱$

$AC^۲ = ۳ + ۴ = ۷ \to AC = \sqrt{۷} \Rightarrow \cancel{AD = AC = ...} \Rightarrow \sin ۲C = ۲\sin C \cos C$

$\Rightarrow ۲ \times \frac{\sqrt{۳}}{\sqrt{۷}} \times \frac{۲}{\sqrt{۷}} = \frac{۴\sqrt{۳}}{۷}$

۲

۱۰)



$\alpha + \beta + \theta = ۹۰$

$\sin\theta = \cos(\alpha + \beta) \Rightarrow \cos\alpha\cos\beta - \sin\alpha\sin\beta \Rightarrow \frac{۹}{۱۳} - \frac{۴}{۱۳} = \frac{۵}{۱۳}$

$\cos\alpha = \frac{۳}{\sqrt{۱۳}}$ $\cos\beta = \frac{۳}{\sqrt{۱۳}}$

$\sin\alpha = \frac{۲}{\sqrt{۱۳}}$ $\sin\beta = \frac{۲}{\sqrt{۱۳}}$

۲