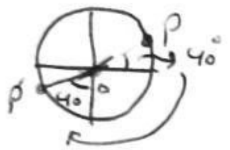
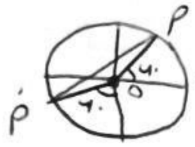
پارمیس شیرازی

1) $\frac{a\times(-\frac{\sqrt{3}}{2})+b\times(-\frac{\sqrt{3}}{2})}{a\times(-\frac{1}{2})+b\times(\frac{1}{2})} = \frac{-\frac{\sqrt{3}}{2}(a+b)}{-\frac{1}{2}(a-b)} \Rightarrow \sqrt{3}\left(\frac{a+b}{a-b}\right) = -\frac{\sqrt{3}}{3} \Rightarrow \frac{a+b}{a-b} = -\frac{1}{3} \Rightarrow b-a=3a+3b$

$-4a=2b$

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

2) $P(\frac{1}{2},\frac{\sqrt{3}}{2}) \Rightarrow$  $\Rightarrow$  $\Rightarrow 270-120=150 \rightarrow$  $\Rightarrow PP'=\sqrt{2+\sqrt{3}}$

$\cos 150 = -\frac{\sqrt{3}}{2}$

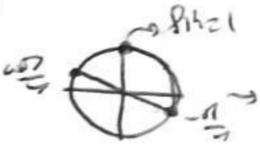
محیط $= 2+\sqrt{2+\sqrt{3}}$

3) $\sim \frac{\pi}{9} \Rightarrow \frac{D}{180}=\frac{R}{\pi} \Rightarrow \frac{\pi}{9\times\pi}=\frac{D}{180} \Rightarrow D=\frac{180}{9}=20 \Rightarrow \frac{360}{12}=30 \rightarrow$ هر ساعت $=30$ $\Rightarrow$ ساعت $\frac{2}{3}$

$\Rightarrow \frac{2}{3}\times 60 = 40\,min \Rightarrow 2:40$

4) $\Rightarrow$ زاویه $= \left|\frac{11M}{2}-30h\right| \sim \frac{11M}{2}-90=20 \Rightarrow \frac{11M}{2}=110 \Rightarrow M=20 \rightarrow 20 > \frac{140}{11} \Rightarrow 20$ تعداد min

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

5) 

$\rightarrow (-\frac{1}{2}, 1] \Rightarrow -\frac{1}{2} < \frac{m-3}{5} \leq 1 \Rightarrow -\frac{5}{2} < m-3 \leq 5 \xrightarrow{+3} \frac{1}{2} < m \leq 8$

$m \in (\frac{1}{2}, 8] \Rightarrow$ گزینه A

6) $\frac{\sin(\frac{\pi}{2}+\alpha)+k\cos(\frac{3\pi}{2}-\alpha)}{\cos(\pi-\alpha)+2\sin(\pi+\alpha)} = \frac{\cos\alpha-k\sin\alpha}{-\cos\alpha-2\sin\alpha} = \frac{k\sin\alpha-\cos\alpha}{2\sin\alpha+\cos\alpha} \Rightarrow \tan\alpha=\frac{1}{4} \rightarrow \frac{\sin}{\cos}=\frac{1}{4}$

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

۷)

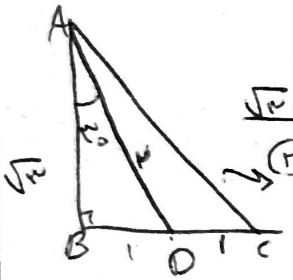
$$\frac{\cot x + \cot x}{\tan x - \tan x} = \frac{2\cot x}{-\tan x} \Big/ \hookrightarrow 2 + 2\cos\beta = 1 - \cos\beta \Rightarrow 3\cos\beta = -1 \Rightarrow \cos\beta = -\frac{1}{3} \Rightarrow \sin^2\beta = 1 - \frac{1}{9} = \frac{8}{9}$$

$$\frac{2\times\frac{\cos\beta}{\sin\beta}}{-\frac{\sin\beta}{\cos\beta}} = \frac{-2\cos^2\beta}{\sin^2\beta} \Big/ \rightsquigarrow \frac{-2\left(\frac{1}{9}\right)}{\frac{8}{9}} = -\frac{1}{4}$$

۸) $\Rightarrow 10 = \frac{2\pi}{\omega} \Rightarrow L = \frac{2\pi}{\omega} R$

$L' = \alpha R = \frac{9\pi}{10} \alpha R'$ $\Rightarrow \frac{2\pi}{\omega} R = \frac{9\pi}{10} R' \Rightarrow 2R = 2R' \Rightarrow \frac{f_A}{f_B} = \frac{9n^2}{3n^2} = \frac{9}{3}$

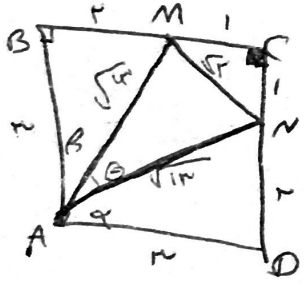
۹)



$AC^2 = 2^2 + 2^2 = 8 \rightarrow AC = 2\sqrt{2} \Rightarrow \sin 2C = 2\sin C\cos C$

$\rightarrow 2 \times \frac{\sqrt{2}}{\sqrt{3}} \times \frac{2}{\sqrt{3}} = \frac{4\sqrt{2}}{3}$

۱۰)



$\alpha + \beta + \theta = 90$

$\sin\theta = \cos(\alpha+\beta) \Rightarrow \cos\alpha\cos\beta - \sin\alpha\sin\beta \Rightarrow \frac{4}{10} - \frac{3}{10} = \frac{1}{10}$

$\cos\alpha = \frac{2}{\sqrt{10}}$ $\cos\beta = \frac{2}{\sqrt{10}}$

$\sin\alpha = \frac{1}{\sqrt{10}}$ $\sin\beta = \frac{1}{\sqrt{10}}$