

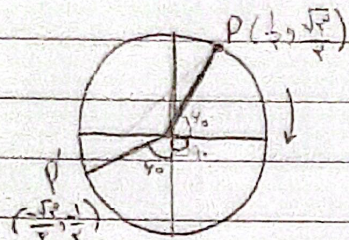
دائرة - (12) 17,5

سؤال (1)

$$\frac{a \sin \frac{\pi}{4} + b \cos \frac{\pi}{4}}{a \sin \frac{3\pi}{4} + b \cos \frac{3\pi}{4}} = \tan \frac{\pi}{4} \rightarrow \frac{-a \frac{\sqrt{2}}{2} + b \frac{\sqrt{2}}{2}}{-\frac{a}{\sqrt{2}} + \frac{b}{\sqrt{2}}} = \frac{-\sqrt{2}}{1} \rightarrow \frac{\sqrt{2}}{2}(-a+b) = -\sqrt{2}$$

$$\rightarrow \frac{-a+b}{-a+b} = \frac{-1}{1} \rightarrow -a+b = -1 \rightarrow -a = -b-1 \rightarrow a = b+1$$

(2)



$$PP' = \sqrt{(\Delta x)^2 + (\Delta y)^2} = \sqrt{(\frac{1}{2} - \frac{1}{2})^2 + (\frac{\sqrt{3}}{2} - (-\frac{\sqrt{3}}{2}))^2} = \sqrt{(\frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{2})^2} = \sqrt{(\sqrt{3})^2} = \sqrt{3}$$

$$\rightarrow \text{مس} = 1 + 1 + (1 + \sqrt{3})\sqrt{3} = 2 + (1 + \sqrt{3})\sqrt{3}$$

سؤال (2)

(2)

$$\frac{r}{q} = \frac{1\lambda_0}{q} = \gamma_0 \rightarrow \text{زاوية سقوط} \rightarrow \frac{v}{c} h \rightarrow \frac{v}{c} \times \gamma_0 = f_0 \rightarrow \boxed{\gamma_0 f_0}$$

سؤال (3)

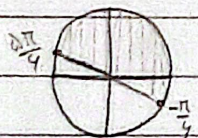
(2)

$$\alpha = |\omega \Delta M - v \cdot h| \rightarrow |\omega \Delta M - v \cdot (r)| = \gamma_0 \rightarrow \omega \Delta M = \gamma_0 \rightarrow M = \gamma_0$$

$$\omega \Delta M - \gamma_0 = -\gamma_0 \rightarrow \omega \Delta M = \gamma_0 \rightarrow M = \gamma_0 v r$$

سؤال (4)

(5)



$$\rightarrow -\frac{\pi}{4} < \alpha \leq \frac{\pi}{4} \rightarrow -\frac{1}{\sqrt{2}} < \sin \alpha \leq \frac{1}{\sqrt{2}} \rightarrow -\frac{1}{\sqrt{2}} < \frac{m-v}{2} \leq \frac{1}{\sqrt{2}} \rightarrow -2 < m-v \leq 2$$

$$\rightarrow 1 < m \leq 3 \rightarrow \boxed{\frac{1}{2} < m \leq 1}$$

سؤال (5)

(2)

$$\frac{\sin(10^\circ) + K \cos(70^\circ)}{\cos(14^\circ) + 4 \sin(14^\circ)} = \frac{\sin(\frac{\pi}{6} + 10^\circ) + K \cos(\frac{\pi}{6} - 10^\circ)}{\cos(\frac{\pi}{6} - 10^\circ) + 4 \sin(\frac{\pi}{6} + 10^\circ)} = \frac{\cos 10^\circ - K \sin 10^\circ}{-\cos 10^\circ - 4 \sin 10^\circ}$$

$$\frac{\cos 10^\circ}{-1 - 4 \tan 10^\circ} = \frac{1 - K \tan 10^\circ}{1 - 4 \tan 10^\circ} = 1 \rightarrow 1 - K \tan 10^\circ = -1 - 4 \tan 10^\circ \rightarrow K \tan 10^\circ = -2 - 4 \tan 10^\circ \rightarrow K = \frac{-2 - 4 \tan 10^\circ}{\tan 10^\circ} = -2 - 4 \cot 10^\circ$$

$$\frac{1 - \cos \alpha}{1 + \cos \alpha} = \gamma \rightarrow \gamma + \gamma \cos \alpha = 1 - \cos \alpha \rightarrow \gamma \cos \alpha = -1 + \cos \alpha \rightarrow \cos \alpha = \frac{-1 + \cos \alpha}{\gamma} \rightarrow \sin \alpha = \sqrt{1 - \cos^2 \alpha} = \sqrt{1 - \frac{(-1 + \cos \alpha)^2}{\gamma^2}} = \frac{\sqrt{\gamma^2 - (-1 + \cos \alpha)^2}}{\gamma}$$

$$\frac{\tan(\frac{\pi}{4} - \alpha) - \cot(\pi - \alpha)}{\cot(\frac{\pi}{4} - \alpha) + 4 \tan(\pi - \alpha)} = \frac{\cot \alpha + \cot \alpha}{\tan \alpha - 4 \tan \alpha} = \frac{\gamma \cot \alpha}{-3 \tan \alpha} = \frac{\gamma \frac{\cos \alpha}{\sin \alpha}}{-3 \frac{\sin \alpha}{\cos \alpha}} = \frac{\gamma \cos^2 \alpha}{-3 \sin^2 \alpha} = \frac{(-1)(\frac{1}{4})}{1}$$

$$= \frac{-\gamma}{4} = \boxed{\frac{-1}{4}}$$

(2)

s.a.m

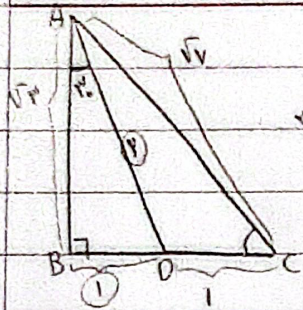
$$r \times \alpha = L \rightarrow \frac{10\pi}{180} \cdot \frac{R}{\pi} \rightarrow R = \frac{180}{\pi}$$

(سوال ۸)

$$\rightarrow \frac{2\pi}{\alpha} \cdot r_A = \frac{4\pi}{10} \cdot r_B \rightarrow \frac{S_A}{S_B} = \left(\frac{r_A}{r_B}\right)^2 = \left(\frac{2}{1}\right)^2 = \boxed{\frac{4}{1}} \checkmark$$

$$\frac{r_A}{r_B} = \frac{\frac{2\pi}{\alpha}}{\frac{4\pi}{10}} = \frac{10}{2} = \left(\frac{5}{1}\right)$$

(۲)



(سوال ۹)

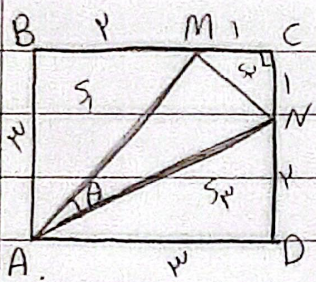
مساحت مثلث قائم الزاویه $\Rightarrow AD = 2 \rightarrow AD^2 = AB^2 + BD^2 \rightarrow 4 = AB^2 + 3 \rightarrow AB = \sqrt{1}$

$$\rightarrow S_{ABC} = \sqrt{3} \rightarrow \frac{\sqrt{3} \times BC}{2} = \sqrt{3} \rightarrow BC = 2 \rightarrow DC = 1$$

$$\rightarrow BC^2 + AB^2 = AC^2 \rightarrow 4 + 1 = AC^2 \rightarrow \boxed{AC = \sqrt{5}}$$

(۲)

$$\sin \gamma \hat{C} = 2 \sin \hat{C} \cos \hat{C} = 2 \times \left(\frac{\sqrt{3}}{\sqrt{5}}\right) \times \left(\frac{1}{\sqrt{5}}\right) = \boxed{\frac{2\sqrt{3}}{5}} \checkmark$$



$$\rightarrow S_1 = \frac{3 \times 3}{2} = \left(\frac{9}{2}\right) \quad S_2 = \frac{1 \times 1}{2} = \left(\frac{1}{2}\right) \quad S_3 = \frac{2 \times 2}{2} = \left(\frac{4}{2}\right)$$

(سوال ۱۰)

$$S_D = 3 \times 4 = 12 \rightarrow S_{AMN} = S_D - (S_1 + S_2 + S_3) = 12 - 7 = \boxed{5}$$

$$\rightarrow \frac{1}{2} \times AN \times AM \times \sin \theta = 5 \rightarrow \frac{1}{2} \times \sqrt{13} \times \sqrt{13} \times \sin \theta = \frac{10}{2}$$

$$AM = AN = \sqrt{4 + 9} = \boxed{\sqrt{13}}$$

$$\rightarrow \boxed{\sin \theta = \frac{1}{13}} \checkmark$$

(۲)