

کتاب (۱۲) - داریوسز دفتر

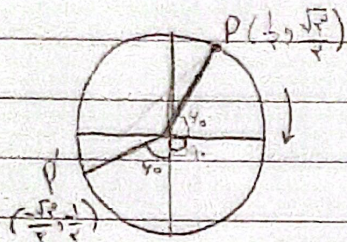
پایان امیر

سوال (۱)

$$\frac{a \sin \frac{\pi}{4} + b \cos \frac{\pi}{4}}{a \sin \frac{11\pi}{4} + b \cos \frac{\pi}{4}} = \tan \frac{\pi}{4} \rightarrow \frac{-a \frac{\sqrt{2}}{2} + -b \frac{\sqrt{2}}{2}}{-\frac{a}{2} + \frac{b}{2}} = \frac{-\sqrt{2}}{1} \rightarrow \frac{\sqrt{2}}{2}(-a-b) = \frac{-\sqrt{2}}{2}$$

$$\rightarrow \frac{-a-b}{-a+b} = \frac{1}{1} \rightarrow -a-b = -a+b \rightarrow -fa = 2b \rightarrow \frac{b}{a} = \frac{f}{2} = \boxed{-2}$$

سوال (۲)



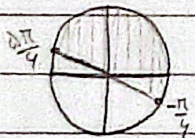
$$PP' = \sqrt{(\Delta x)^2 + (\Delta y)^2} = \sqrt{\left(\frac{1}{2} + \frac{\sqrt{3}}{2}\right)^2 + \left(\frac{\sqrt{3}}{2} - \frac{1}{2}\right)^2} = \frac{(1+\sqrt{3})\sqrt{2}}{2}$$

$$\rightarrow \cos = 1 + 1 + \frac{(1+\sqrt{3})\sqrt{2}}{2} = \boxed{2 + \frac{(1+\sqrt{3})\sqrt{2}}{2}}$$

سوال (۳)

$$\frac{17}{9} = \frac{170}{9} = 19^\circ \rightarrow \text{زاویه } 19^\circ \text{ است} \rightarrow \frac{17}{9}h \rightarrow \frac{17}{9} \times 90 = f_{\text{نسبت}} \Rightarrow \boxed{2: f_0'}$$

سوال (۴)



$$\rightarrow -\frac{\pi}{4} < x \leq \frac{5\pi}{4} \rightarrow -\frac{1}{2} < \sin x \leq 1 \rightarrow -\frac{1}{2} < \frac{m-3}{2} \leq 1 \rightarrow -2 < m-3 \leq 1$$

$$\rightarrow 1 < m \leq 4 \rightarrow \boxed{\frac{1}{2} < m \leq 1} \rightarrow \text{داده شده } 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 \Rightarrow \text{مجموع}$$

سوال (۵)

$$\frac{\sin(10^\circ) + K \cos(140^\circ)}{\cos(140^\circ) + 4 \sin(140^\circ)} = \frac{\sin(\frac{\pi}{18} + 10) + K \cos(\frac{4\pi}{9} - 10)}{\cos(\frac{4\pi}{9} - 10) + 4 \sin(\frac{4\pi}{9} - 10)} = \frac{\cos 10 - K \sin 10}{-\cos 10 - 4 \sin 10}$$

$$\xrightarrow{\div \cos 10} \frac{1 - K \tan 10}{-1 - 4 \tan 10} = \frac{1 - K(0.176)}{1 - 4(0.176)} = 2 \rightarrow 1 - K(0.176) = 2 - 0.704 \rightarrow K(0.176) = -0.704 \rightarrow \boxed{K = -4}$$

$$\frac{1 - \cos x}{1 + \cos x} = 2 \rightarrow 1 + \cos x = 2(1 - \cos x) \rightarrow 1 + \cos x = 2 - 2 \cos x \rightarrow 3 \cos x = 1 \rightarrow \cos x = \frac{1}{3} \rightarrow \sin x = \sqrt{1 - \cos^2 x} = \sqrt{1 - \frac{1}{9}} = \frac{\sqrt{8}}{3} \quad \text{سوال}$$

$$\frac{\tan(\frac{\pi}{3} - x) - \cot(\pi - x)}{\cot(\frac{\pi}{3} - x) + 4 \tan(\pi - x)} = \frac{\cot x + \cot x}{\tan x - 4 \tan x} = \frac{2 \cot x}{-3 \tan x} = \frac{2 \frac{\cos x}{\sin x}}{-3 \frac{\sin x}{\cos x}} = \frac{2 \cos^2 x}{-3 \sin^2 x} = \frac{(-1)(\frac{1}{9})}{1}$$

$$= \frac{-2}{3} = \boxed{\frac{-1}{3}}$$

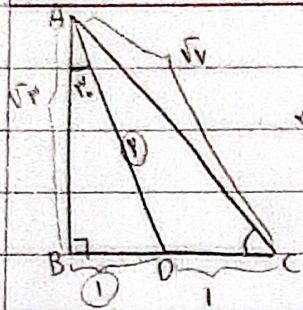
s.a.m

$$r \times \alpha = L \rightarrow \frac{10\pi}{180} \times \frac{R}{\pi} \rightarrow R = \frac{36}{5}$$

(سوال ۸)

$$\rightarrow \frac{2\pi}{3} \times r_A = \frac{4\pi}{15} \times r_B \rightarrow \frac{S_A}{S_B} = \left(\frac{r_A}{r_B}\right)^2 = \left(\frac{2}{3}\right)^2 = \boxed{\frac{4}{9}}$$

$$\frac{r_A}{r_B} = \frac{\frac{4\pi}{15}}{\frac{2\pi}{3}} = \frac{f_D}{f_A} = \left(\frac{2}{3}\right)$$



(سوال ۹)

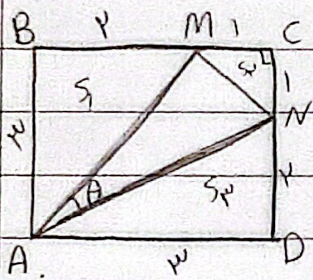
مساحت مثلث قائم الزاویه $\Rightarrow AD = 2 \rightarrow AD^2 = AB^2 + BD^2 \rightarrow 4 = AB^2 + 1 \rightarrow AB = \sqrt{3}$

$\rightarrow$

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

$$\rightarrow BC^2 + AB^2 = AC^2 \rightarrow 4 + 3 = AC^2 \rightarrow \boxed{AC = \sqrt{7}}$$

$$\sin \theta = \frac{BD}{AD} = \frac{2 \sin \theta \cos \theta}{2} = 2 \times \left(\frac{\sqrt{3}}{\sqrt{7}}\right) \times \left(\frac{1}{\sqrt{7}}\right) = \boxed{\frac{2\sqrt{3}}{7}}$$



$$\rightarrow S_1 = \frac{3 \times 3}{2} = \frac{9}{2} \quad S_2 = \frac{1 \times 1}{2} = \frac{1}{2} \quad S_3 = \frac{3 \times 3}{2} = \frac{9}{2}$$

(سوال ۱۰)

$$S_D = 3 \times 3 = 9 \rightarrow S_{AMN} = S_D - (S_1 + S_2 + S_3) = 9 - \frac{9}{2} = \boxed{\frac{9}{2}}$$

$$\rightarrow \frac{1}{2} \times AN \times AM \times \sin \theta = \frac{9}{2} \rightarrow \frac{1}{2} \times \sqrt{13} \times \sqrt{13} \times \sin \theta = \frac{9}{2}$$

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

$$\rightarrow \boxed{\sin \theta = \frac{9}{13}}$$