۲۰

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① $\dfrac{a\sin\frac{4\pi}{3} + b\cos\frac{7\pi}{6}}{a\sin\frac{11\pi}{6} + b\cos\frac{\pi}{3}} = \tan\frac{5\pi}{6} = -\frac{\sqrt{3}}{3}$ $\quad \frac{b}{a} = ?$

$\dfrac{-\frac{\sqrt{3}}{2}a + (-\frac{\sqrt{3}}{2}b)}{-\frac{1}{2}a + \frac{1}{2}b} \to \dfrac{-\frac{\sqrt{3}}{2}(a+b)}{\frac{1}{2}(-a+b)} = -\frac{\sqrt{3}}{3} \Rightarrow$

$3a + 3b = -a + b \to 4a = -2b \to \frac{b}{a} = \frac{4}{-2} = -2$

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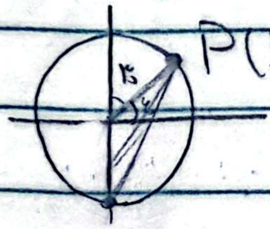
② $P(\frac{1}{2}, y) \xrightarrow[\text{ساعت}]{210^\circ} P'$

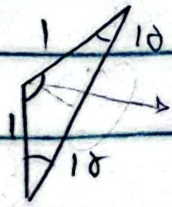


$(\frac{1}{2})^2 + (y^2) = (1)^2 \to \frac{1}{4} + y^2 = 1$

$\frac{3}{4} = y^2 \to y = \pm\frac{\sqrt{3}}{2}$ ربع اول $\to +\frac{\sqrt{3}}{2}$

$(\frac{1}{2}, \frac{\sqrt{3}}{2}) \to 60^\circ$

$60 + 210 = 270^\circ$ ← OPP' محیط



$90 + 60 = 150$

$\sqrt{1 + 1 - 2\times\cos 150^\circ} \Rightarrow \sqrt{2+\sqrt{3}}$

$2 + \sqrt{2+\sqrt{3}} = OPP'$ محیط

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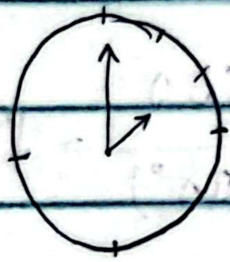

$\frac{\pi}{9} \Rightarrow \frac{180}{9} = 20^\circ$

فاصله هر دو عدد در یک ساعت ۳۰° است زمانی به ۲۰ رسیده یعنی

۲/۳ رسیده یعنی ساعت ۲:۴۰ است

(۴)

$|5.5\,min - 30H| \xrightarrow{\text{ساعت ۳}} |5.5\,min - 90| = 20^\circ \rightarrow$

$5.5\,min - 90 = 20 \rightarrow 5.5\,min = 90 + 20 \Rightarrow 5.5\,min = 110 \rightarrow min = 20$

$5.5\,min - 90 = -20 \rightarrow 5.5\,min = 70 \rightarrow min \simeq 12.7$

پس زمانی که ساعت ۳:۲۰ دقیقه باشد یا بعد از زاویه بین ساعت شمار و دقیقه شمار ۲۰ است

(۵)

$\sin x = \frac{m-3}{5} \qquad -\frac{\pi}{6} < x \leq \frac{5\pi}{6} \rightarrow -\frac{1}{2} < \sin x \leq 1$

$-\frac{1}{2} < \frac{m-3}{5} \leq 1 \Rightarrow -\frac{5}{2} < m-3 \leq 5 \Rightarrow -\frac{5}{2} + 3 < m \leq 5 + 3$

$\frac{1}{2} < m \leq 8$

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$\tan 15 = 0.25^{\circ}$

$$\frac{\sin(105)^{\circ} + K\cos(255^{\circ})}{\cos(165^{\circ}) + 2\sin(195^{\circ})} = 3 \qquad k = ?$$

$$\frac{\sin(\frac{\pi}{2}+15^{\circ}) + K\cos(\frac{3\pi}{2}-15^{\circ})}{\cos(\pi-15^{\circ}) + 2\sin(\pi+15^{\circ})} \Rightarrow \frac{\cos 15^{\circ} - K\sin 15^{\circ}}{-\cos 15 - 2\sin 15^{\circ}} = 3 \;\div \cos 15^{\circ} \Rightarrow$$

(2)

$$\frac{1-0.25k}{-1-2(0.25)} = 3 \Rightarrow \frac{1-0.25k}{-1.5} = 3 \Rightarrow \frac{-9}{2} = 1-0.25k \Rightarrow$$

$(0.5$ under $2(0.25))$

$$-\frac{11}{2} = -\frac{1}{4}k \Rightarrow \underline{k = 22}$$

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(7) معمولی

$$\frac{1-\cos x}{1+\cos x} = 2 \rightarrow 2 + 2\cos x = 1 - \cos x \Rightarrow$$

$$1 = -3\cos x \rightarrow \frac{-1}{3} = \cos x$$

(2)

$$\frac{\tan(\frac{\pi}{2}-x) - \cot(\pi - x)}{\cot(\frac{3\pi}{2}-x) + 2\tan(2\pi - x)} \rightarrow \frac{\cot x - (-\cot \alpha)}{\tan x + 2(-\tan x)} \;\star \rightarrow$$

$$\cos = \frac{-1}{3} \rightarrow \cos^2 x + \sin^2 x = 1 \rightarrow \frac{1}{9} + x^2 = 1 \rightarrow x^2 = \frac{8}{9} = \frac{2\sqrt{2}}{3}$$

$$\cot x = \frac{-1}{3} \times \frac{3}{2\sqrt{2}} = \frac{-1}{2\sqrt{2}} \qquad \tan x = \frac{2\sqrt{2}}{-3} \times -3 = -2\sqrt{2}$$

$$\star \rightarrow \frac{-2}{2\sqrt{2}} \times \frac{1}{\frac{(-2\sqrt{2}+4\sqrt{2})}{2\sqrt{2}}} \Rightarrow \frac{-2}{8} = \frac{-1}{4}$$

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طول کمان A = طول کمان B ، طول کمان $= \theta r$

$108^\circ \qquad \frac{9\pi}{10}$

$\frac{108\pi}{180} \Rightarrow \frac{36\pi}{60} = \frac{6\pi}{10}$

$\rightarrow \frac{6\pi}{10} \times r_A = \frac{9\pi}{10} r_B \rightarrow$

$\frac{r_A}{r_B} = \frac{9}{6} = \frac{3}{2}$

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

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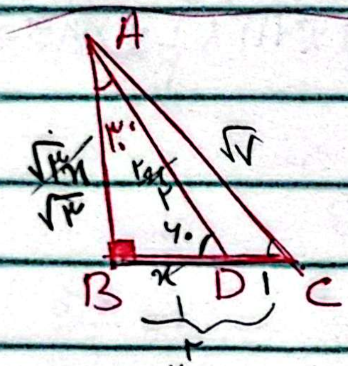

$S_{ABC} = \sqrt{3} \rightarrow \frac{\sqrt{3} \times (1 + DC)}{2} = \sqrt{3}$

$\sin 2\hat{C} = ?$

$BD = 1 \rightarrow x = 1 \qquad 1 + DC = 2 \rightarrow DC = 1$

$x^2 + AB^2 = 4x^2 \rightarrow AB^2 = 3x^2 \rightarrow \sqrt{3}x = \sqrt{3}$

$\sin 2C = 2\sin\hat{C}\cos\hat{C} \rightarrow \sin\hat{C} = \frac{\sqrt{3}}{\sqrt{7}} , \cos\hat{C} = \frac{2}{\sqrt{7}}$

$(\sqrt{3})^2 + (2)^2 = AC^2 \rightarrow 3 + 4 = 7 \rightarrow AC = \sqrt{7}$

$2 \times \frac{2}{\sqrt{7}} \times \frac{\sqrt{3}}{\sqrt{7}} \Rightarrow \frac{4\sqrt{3}}{7}$

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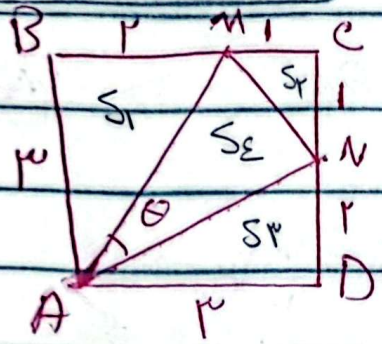

$S_{ABCD} = ۳^۲ = ۹$ (۱۵)

$S_{ABCD} - S_۱ - S_۲ - S_۳ = S_۴$ ⟵ ☆

$S_۱ = \frac{۲ \times ۳}{۲} = ۳$ $S_۲ = \frac{۱ \times ۱}{۲} = \frac{۱}{۲}$ $S_۳ = \frac{۲ \times ۳}{۲} = ۳$

☆ ⟶ $۹ - ۳ - ۳ - \frac{۱}{۲} = \frac{۵}{۲}$

$MA \Rightarrow \sqrt{۳^۲ + ۲^۲} = \sqrt{۹+۴} = \sqrt{۱۳}$

$AN \Rightarrow \sqrt{۳^۲ + ۲^۲} = \sqrt{۹+۴} = \sqrt{۱۳}$

$\Rightarrow \sqrt{۱۳} \times \sqrt{۱۳} \times \frac{۱}{۲} \times \sin\theta = \frac{۵}{۲}$

$\Rightarrow ۱۳ \times \frac{۱}{۲} \times \sin\theta = \frac{۵}{۲} \longrightarrow \sin\theta = \frac{۵}{۱۳}$

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