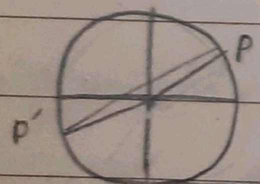
صالح صالحی — به نام آنکه جان را فکرت آموخت — دوازدهم تجربی B - کلینیک ۱۲

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

$$\rightarrow 3a+3b=b-a\rightarrow 4a=-2b\rightarrow -2a=b\rightarrow\frac{b}{a}=\frac{-2a}{a}=\frac{-2}{1}$$

(2) $$\cos P=\frac{1}{2}\xrightarrow{P<\frac{\pi}{2}}P=\frac{\pi}{3}\rightarrow y=\frac{\sqrt{3}}{2}\qquad \frac{\pi}{3}-\frac{7\pi}{6}=\frac{-5\pi}{6}=\frac{7\pi}{6}$$



$$P'\left|\begin{matrix}-\frac{\sqrt{3}}{2}\\-\frac{1}{2}\end{matrix}\right.\rightarrow \text{فاصله } P', P=\sqrt{\left(\frac{1}{2}-\left(-\frac{\sqrt{3}}{2}\right)\right)^2+\left(\frac{\sqrt{3}}{2}-\left(-\frac{1}{2}\right)\right)^2}=$$

$$\sqrt{2\left(\frac{1}{2}+\frac{\sqrt{3}}{2}\right)^2}=\left|\frac{1}{2}+\frac{\sqrt{3}}{2}\right|\sqrt{2}\rightarrow P_{\overset{\triangle}{OPP'}}=1+1+\left(\frac{1}{2}+\frac{\sqrt{3}}{2}\right)\sqrt{2}$$

$$=2+\frac{1+\sqrt{3}}{\sqrt{2}}$$

صفحه ی دوم

(۳)

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

درجه	دقیقه
۳۰°	۹۰
۲۰°	۳۰

$\rightarrow 2:40'$

(۴)

$\alpha = \left|\frac{11m}{2} - 30h\right| \rightarrow 20 = \left|\frac{11m}{2} - 90\right|$

$\rightarrow 20 = \frac{11m}{2} - 90 \rightarrow m = 20$ ✓ بار دوم

$\rightarrow -20 = \frac{11m}{2} - 90 \rightarrow m = \frac{140}{11}$ بار اول

(۵)

$-\frac{\pi}{6} < x < \frac{5\pi}{6}$

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

$\rightarrow -\frac{5}{2} < m-3 \leq 5 \rightarrow \frac{1}{2} < m \leq 8 \rightarrow m = \left(\frac{1}{2}, 8\right]$

(۶)

$\frac{\sin(\frac{\pi}{2}+\alpha) + k\cos(\frac{3\pi}{2}-\alpha)}{\cos(\pi-\alpha) + 2\sin(\pi+\alpha)} = \frac{\cos\alpha - k\sin\alpha}{-\cos\alpha - 2\sin\alpha} \xrightarrow{\div \cos\alpha}$ $15^\circ = \alpha$

$3 = \frac{1 - k\tan\alpha}{-1 - 2\tan\alpha} \xRightarrow{\tan\alpha = \frac{1}{4}} -3 - \frac{3}{2} = 1 - \frac{k}{4} \rightarrow \frac{-11}{2} = \frac{-k}{4} \rightarrow k = 22$

(۷)

$\cos x, \sin x > 0$

$\frac{\cot x + \cot x}{\tan x - 2\tan x} = \frac{2\cot x}{-\tan x} = -2 \times \cot^2 x = \frac{-2}{\tan^2 x}$

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

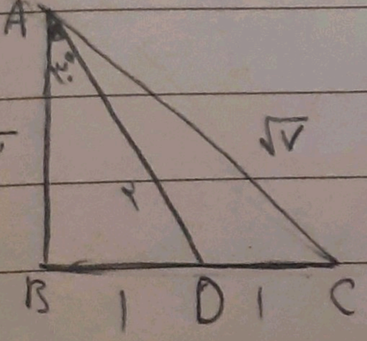
$\rightarrow \frac{-2}{\tan^2 x} = \frac{-2}{(2\sqrt{2})^2} = \frac{-2}{8} = -\frac{1}{4}$

(۸)

$108 \times \frac{\pi}{180} = \frac{3\pi}{5}$

$\frac{P_A}{P_B} = \frac{\frac{9\pi}{10}}{\frac{3\pi}{5}} = \frac{9}{10} \times \frac{5}{3} = \frac{3}{2} \rightarrow \left(\frac{S_A}{S_B}\right) = \left(\frac{P_A}{P_B}\right)^2 = \frac{9}{4}$

(۹)



$S_{\hat{ABC}} = \sqrt{3}$

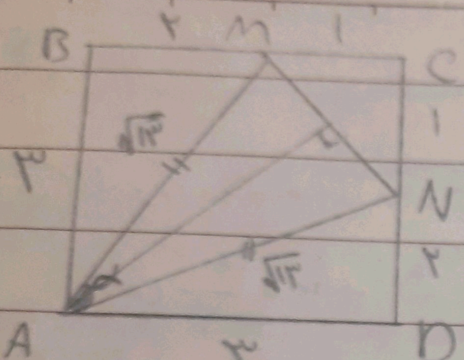
$AD = \frac{1}{\sin 30^\circ} \times 1 = 2 \quad AB = \sqrt{2^2 - 1^2} = \sqrt{3}$

$\frac{\sqrt{3} \times BC}{2} = \sqrt{3} \rightarrow BC = 2 \quad AC = \sqrt{2^2 + (\sqrt{3})^2} = \sqrt{7}$

$\sin C = \frac{2}{\sqrt{7}}, \cos C = \sqrt{\frac{3}{7}} \rightarrow \sin 2C = 2\sin C\cos C = 2 \times \frac{2}{\sqrt{7}} \times \frac{\sqrt{3}}{\sqrt{7}} = \frac{4\sqrt{3}}{7}$

[illegible]

۱۰



$AM = AN = \sqrt{۲^۲ + ۳^۲} = \sqrt{۱۳}$

$\sin\frac{\alpha}{۲} = \frac{۱}{\sqrt{۱۳}} \quad , \quad \cos\frac{\alpha}{۲} = \sqrt{\frac{۱۲}{۱۳}}$

$\sin\alpha = ۲\sin\frac{\alpha}{۲}\cos\frac{\alpha}{۲} = ۲ \times \frac{۱}{\sqrt{۱۳}} \times \sqrt{\frac{۱۲}{۱۳}} = \frac{۴\sqrt{۳}}{۱۳}$