۲۰

مهتا محلوجی - پاسخ تشریحی تکلیف ۱۲

۱- $\frac{b}{a}=? \quad \frac{-2a}{a}=(-2)$ $\qquad \frac{a\sin\frac{4\pi}{3}+b\cos\frac{7\pi}{6}}{a\sin\frac{11\pi}{6}+b\cos\frac{\pi}{3}}=\tan\frac{5\pi}{6}$

$$\frac{\overbrace{a\sin\frac{4\pi}{3}}^{-\frac{\sqrt{3}}{2}a}+\overbrace{b\cos\frac{7\pi}{6}}^{-\frac{\sqrt{3}}{2}b}}{\underbrace{a\sin\frac{11\pi}{6}}_{-\frac{1}{2}a}+\underbrace{b\cos\frac{\pi}{3}}_{b\frac{1}{2}}}=\tan\frac{5\pi}{6}\ (150°)=-\frac{\sqrt{3}}{3}$$

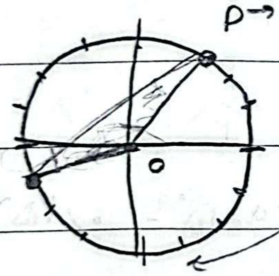
۲

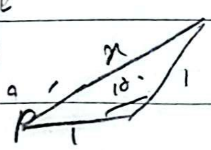
$$\frac{-\frac{\sqrt{3}}{2}(a+b)}{\frac{1}{2}(a-b)}=-\frac{\sqrt{3}}{3}\ \longrightarrow\ -3a-3b=a-b$$

$-2b=4a \leftarrow$ $-b=2a$

$b=-2a$ ✓

۲- $p\to 60°$





$P(\frac{1}{2}, y)$ روی $\frac{\pi}{3}$ قرار دارد ($\frac{1}{2}$: Cos، y: Sin) — $60°$

$y=\frac{\sqrt{3}}{2}$ ۲

طبق قضیه کسینوس ها

$x^2=1+1-2(1)(1)\cos(150)$

$x=\sqrt{2+\sqrt{3}} \leftarrow x^2=2-2(-\frac{\sqrt{3}}{2})=2+\sqrt{3}$

محیط $=1+1+\sqrt{2+\sqrt{3}}=2+\sqrt{2+\sqrt{3}}$ ✓

۳- ساعت ۲ عقربه ساعت شمار $\frac{\pi}{9}$ بچرخد

$\frac{\frac{\pi}{9}}{\pi}=\frac{D}{180}\longrightarrow D=20°\longrightarrow$ عقربه ساعت شمار به اندازه‌ی نصف دقیقه می‌چرخد ۲

پس ساعت ۲:۴۰ است ✓

۴_ پس از گذشت ۲۰ دقیقه

$$\alpha = \left|\frac{11}{2}M - 30H\right|$$

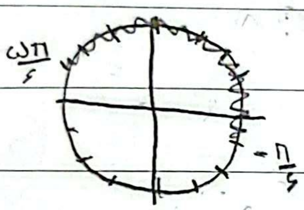
$$20 = \left|\frac{11M}{2} - 30\times 3\right| \rightarrow 20 = \left|\frac{11M}{2} - 90\right|$$

$$\frac{11M}{2} - 90 = -20 \quad \text{یا} \quad \frac{11M}{2} - 90 = 20$$

$$\frac{11M}{2} = 70 \qquad \frac{11M}{2} = 110 \rightarrow M = 20 \;(2)$$

$$M = \frac{140}{11} \;(1)$$

۵_ $$\sin x = \frac{m-3}{5} \qquad -\frac{\pi}{6} < x < \frac{5\pi}{6}$$



$$-\frac{1}{2} < \sin x \leq 1$$

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

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

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

$$m = 1, 2, 3, 4, 5, 6, 7, 8$$

۸ عدد صحیح

۶_ $\tan 15^\circ = 0.25$

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

$$\frac{\sin(\frac{\pi}{2}+15) + k\cos(\frac{3\pi}{2}-15)}{\cos(\pi-15) + 2\sin(\pi+15)} = 3$$

$$\frac{\cos(15) - k\sin(15)}{-\cos(15) - 2\sin(15)} = 3 \xrightarrow{\div \cos 15}$$

$$\frac{1 - k\tan 15}{-1 - 2\tan 15} = 3 \rightarrow \frac{1 - 0.25k}{-1.5} = 3$$

$$1 - 0.25k = -4.5$$

$$5.5 = 0.25k$$

$$k = 22$$

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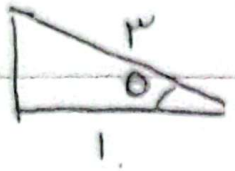
$$\frac{\tan\left(\frac{\pi}{2}-x\right)-\cot(\pi-x)}{\cot\left(\frac{3\pi}{2}-x\right)+2\tan(2\pi-x)}$$

$x^2=9-1$

$x=\sqrt{8}$



$$\frac{\cot x+\cot x}{\tan x-2\tan x}=\frac{\frac{-2}{\sqrt{8}}}{-\sqrt{8}+2\sqrt{8}}=\frac{-\frac{2}{\sqrt{8}}}{\sqrt{8}}=-\frac{2}{8}=\frac{-1}{4}$$

$\frac{1}{\sqrt{8}}=\frac{\sqrt{8}}{8}$

$$\frac{1-\cos x}{1+\cos x}=2 \quad -7$$

زاویه حاده

$1-\cos x=2+2\cos x$

$-1=3\cos x$

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

۲

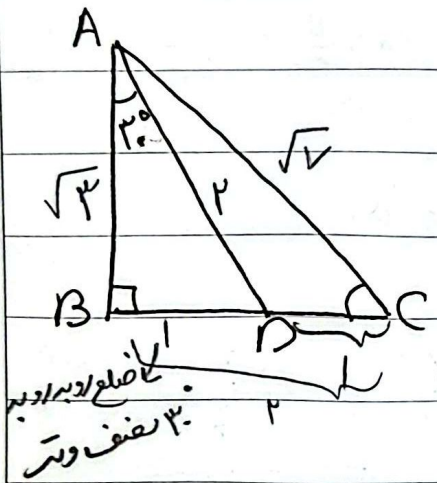
$\frac{180}{360} = \frac{Rad}{\pi} \rightarrow Rad = \frac{3}{6}\pi$ -۸

$L_A = \frac{3\pi}{6} \times r_A$ $\quad \frac{S_A}{S_B} = \frac{\pi r_A^2}{\pi r_B^2} = \left(\frac{\frac{3}{2}r_B}{r_B}\right)^2 = \frac{9}{4}$ ✓

$L_B = \frac{9\pi}{10} \times r_B$

$L_A = L_B \rightarrow \frac{3\pi}{6} \times r_A = \frac{9\pi}{10} \times r_B$ (۲)

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



-۹

$AB^2 = AD^2 - BD^2$

$AB^2 = 4 - 1 = 3 \rightarrow AB = \sqrt{3}$

$S_{مثلث} = \frac{\sqrt{3} \times BC}{2} = \sqrt{3}$

$BC = 2$

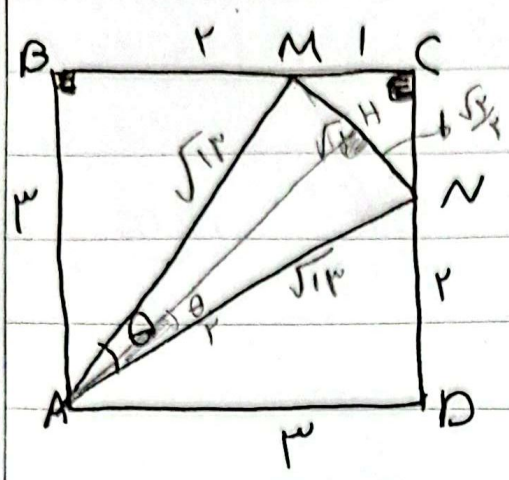
$AC^2 = AB^2 + BC^2 = 3 + 4 = 7 \rightarrow AC = \sqrt{7}$

$\sin C = \frac{\sqrt{3}}{\sqrt{7}}$ $\quad \cos C = \frac{2}{\sqrt{7}}$ $\quad \sin 2C = 2 \sin C \cos C$

$2 \times \frac{\sqrt{3}}{\sqrt{7}} \times \frac{2}{\sqrt{7}} =$ (۲)

$\frac{4\sqrt{3}}{7}$ ✓

-10



$MN^2 = 1^2 + 1^2 = 2$

$MN = \sqrt{2}$

$AN^2 = ND^2 + AD^2$

$AN^2 = 4 + 9 = 13$

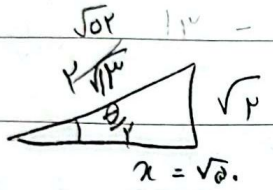
$AN = \sqrt{13}$

$AM^2 = BM^2 + AB^2$

$4 + 9 = 13$

$AM = \sqrt{13}$

$\sin\frac{\theta}{2} = \frac{\frac{\sqrt{2}}{2}}{\sqrt{13}} = \frac{\sqrt{2}}{2\sqrt{13}}$ $\quad \cos\frac{\theta}{2} = \frac{\sqrt{50}}{2\sqrt{13}} = \frac{5\sqrt{2}}{2\sqrt{13}}$



$x^2 = 52 - 2 = 50$

$x = \sqrt{50}$

(2)

$\sin\theta = 2\sin\frac{\theta}{2}\cos\frac{\theta}{2} = 2 \times \frac{\sqrt{2}}{2\sqrt{13}} \times \frac{5\sqrt{2}}{2\sqrt{13}} = \frac{5 \times 2}{2 \times 13}$

$\sin\theta = \frac{5}{13}$ ✓

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