نام و نام خانوادگی ....امیرمحمد ابوطالبی.......

پاسخنامه تشریحی تکلیف شماره .... کلاس ....

۱

$\sin\frac{4\pi}{3} = -\frac{\sqrt{3}}{2}$

$\cos\frac{7\pi}{6} = -\frac{\sqrt{3}}{2}$

$\sin\frac{11\pi}{6} = -\frac{1}{2}$

$\cos\frac{\pi}{3} = \frac{1}{2}$

$\tan\frac{5\pi}{6} = -\frac{\sqrt{3}}{3}$

$$\longrightarrow \frac{a\sin\frac{4\pi}{3} + b\cos\frac{7\pi}{6}}{a\sin\frac{11\pi}{6} + b\cos\frac{\pi}{3}} = \frac{-\frac{\sqrt{3}a}{2} - \frac{\sqrt{3}b}{2}}{-\frac{1}{2}a + \frac{1}{2}b} = \frac{-\sqrt{3}}{3}$$

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

$$3a+3b = b-a \rightarrow 4a = -2b \rightarrow \boxed{b = -2a} \rightarrow \frac{b}{a} = \frac{-2a}{a} = (-2)$$

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$y = \frac{\sqrt{3}}{2} \longrightarrow P(\frac{1}{2}, \frac{\sqrt{3}}{2})$

$\longrightarrow$

$$(-\tfrac{1}{2} - \tfrac{\sqrt{3}}{2})^2 + (-\tfrac{\sqrt{3}}{2} - \tfrac{1}{2})^2 = x^2$$

$$\frac{1+3+2\sqrt{3}}{4} + \frac{1+3+2\sqrt{3}}{4} = x^2$$

$$\frac{8+4\sqrt{3}}{4} = x^2 \rightarrow x = \sqrt{\frac{8+4\sqrt{3}}{4}} = \sqrt{2+\sqrt{3}}$$

محیط مثلث $\longrightarrow$ $\boxed{2 + \sqrt{2+\sqrt{3}}}$

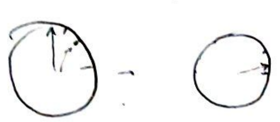
۳

$\frac{\frac{\pi}{9}}{\pi} = \frac{x}{180} \rightarrow \boxed{x = 20}$

با توجه به ساعت شمار ۳۰ درجه تغییر کند

$30^\circ \longrightarrow 60_{min}$ عقربه دقیقه شمار ۶۰ دقیقه دور

$20^\circ \longrightarrow 40_{min}$



ساعت ۲ و ۴۰ دقیقه خواهد بود.

۴

$|30 \times$ ساعت $-$ دقیقه $\times 5.5| =$ زاویه بین عقربه ساعت شمار و دقیقه شمار

$|3 \times 30 -$ دقیقه $\times 5.5| = 20$

$\longrightarrow \simeq 12.5$

$\longrightarrow 20 \longrightarrow (20)$

در دقیقه ۲۰ زاویه بین ساعت شمار و دقیقه شمار ۲۰ درجه می‌شود.

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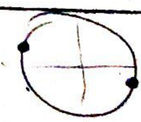
$-\frac{\pi}{6} = 330^\circ$ $\longrightarrow 330 \leq x \leq 150 \longrightarrow$



$\frac{5\pi}{6} = 150^\circ$

$$-1 \leq \sin x \leq \frac{1}{2} \longrightarrow -1 \leq \frac{m-4}{5} \leq \frac{1}{2} \longrightarrow \frac{m-4}{5} \leq \frac{1}{2}$$

$-1 \leq \frac{m-4}{5} \rightarrow -5 \leq m-4 \rightarrow -2 \leq m$

$2m-6 \leq 5 \rightarrow 2m \leq 11 \rightarrow m \leq 5.5$

$\boxed{-2 \leq m \leq 5.5}$

$\sin(105) = \cos 15$

$\cos(255) = -\sin 15$

$\cos(165) = -\cos 15$

$\sin(195) = -\sin 15$

$\longrightarrow \dfrac{\cos 15 - k\sin 15}{-\cos 15 - 2\sin 15} = 3 \qquad \dfrac{\sin 15}{\cos 15} = \dfrac{1}{4}$

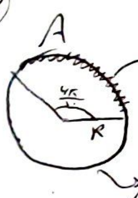
$\longrightarrow \dfrac{4 - k}{-4 - 2} = 3 \longrightarrow -18 = 4 - k \longrightarrow \boxed{k = 22}$ ۶

$\dfrac{1 - \cos x}{1 + \cos x} = 2 \longrightarrow 2 + 2\cos x = 1 - \cos x \longrightarrow 3\cos x = -1 \longrightarrow \cos x = -\frac{1}{3}$

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

$\dfrac{\cot x + \cot x}{\tan x - 2\tan x} = \dfrac{2\cot x}{-\tan x} = \dfrac{\frac{2\cos}{\sin}}{\frac{-\sin}{\cos}} = \dfrac{-2\cos^2}{\sin^2} = \dfrac{-\frac{2}{9}}{\frac{8}{9}} = \dfrac{-2}{8} = \boxed{-\frac{1}{4}}$ ۷

$\dfrac{108}{180} = \dfrac{x}{\pi} \longrightarrow x = \dfrac{6\pi}{10} = \dfrac{3\pi}{5}$

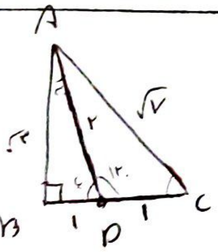


$\dfrac{6R\pi}{10}$

$\dfrac{9r\pi}{10} \longrightarrow \dfrac{9r\pi}{10} = \dfrac{6R\pi}{10} \longrightarrow 9r = 6R$ ۸

$3r = 2R \longrightarrow \boxed{R = \frac{3}{2}r}$

مساحت A $= \frac{3}{2}r \times \frac{3}{2}r \times \pi = \pi r^2 \frac{9}{4}$ مساحت B $= r \times r \times \pi = \pi r^2 \longrightarrow \dfrac{S_A}{S_B} = \dfrac{\frac{9}{4}\pi r^2}{\pi r^2} = \boxed{\frac{9}{4}}$



$AD = 2 \qquad DC = 1$

$BD = 1$

$AB = \sqrt{3}$

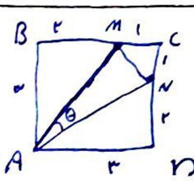
$\longrightarrow \dfrac{AB \times BC}{2} = \sqrt{3} \longrightarrow \dfrac{\sqrt{3} \times BC}{2} = \sqrt{3} \longrightarrow BC = 2$

$BC - BD = DC \longrightarrow \boxed{DC = 1}$ ($2 - 1$)

$\sin 2C = 2 \times \sin C \times \cos C = 2 \times \frac{\sqrt{3}}{\sqrt{7}} \times \frac{2}{\sqrt{7}}$ ۹

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

$S(ADC) = \frac{1}{2} \times 1 \times 2 \times \sin 120 \left(\frac{\sqrt{3}}{2}\right) \longrightarrow S(ADC) = \frac{\sqrt{3}}{2} \longrightarrow \frac{\sqrt{3}}{2} = \frac{1}{2} \times 1 \times \sqrt{7} \times \sin C \longrightarrow \sin C = \frac{\sqrt{3}}{\sqrt{7}} \rightarrow \cos C = \frac{2}{\sqrt{7}}$



$S(ABCD) = 3 \times 3 = 9$

$S(A\hat{B}M) = \frac{3 \times 2}{2} = 3$

$S(A\hat{D}N) = \frac{3 \times 2}{2} = 3 \longrightarrow S(A\hat{M}N) = 9 - 6.5 = 2.5$

$S(M\hat{N}C) = \frac{1 \times 1}{2} = \frac{1}{2}$

$AM^2 = AB^2 + BM^2 \longrightarrow AM^2 = 9 + 4 \longrightarrow AM = \sqrt{13}$ ۱۰

$AN^2 = ND^2 + AD^2 \longrightarrow AN^2 = 9 + 4 \longrightarrow AN = \sqrt{13}$ $\longrightarrow$ مثلث $(A\hat{M}N)$ متساوی الساقین است.

$S(A\hat{M}N) = \frac{1}{2} \times AN \times AM \times \sin\theta = 2.5 \longrightarrow \frac{1}{2} \times \sqrt{13} \times \sqrt{13} \times \sin\theta = 2.5 \longrightarrow \boxed{\sin\theta = \frac{5}{13}}$