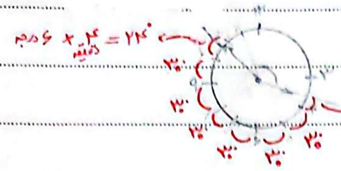
۱۷/۲۵

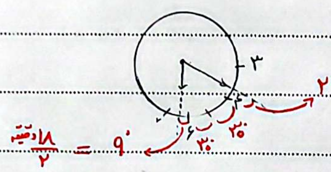
۱) الف)



$(30\times 6) + 3 + 24 = 207 \rightarrow 360 - 207 = \boxed{153}$ (کوچکتر از ۱۸۰)

ب) $\alpha = |5.5\,min - 30h| \rightarrow \left|\left(\frac{55}{10}\times 54\right) - (30\times 3)\right| = 207°$ یا $360-207 = \boxed{153°}$

۲) الف)



$12 + (30\times 2) + 9 = \boxed{81°}$

ب) $\alpha = |5.5\,min - 30h| \rightarrow \left|\left(\frac{55}{10}\times 18\right) - (30\times 6)\right| = \boxed{81°}$

۳) الف) $S = \frac{\alpha}{2}R^2 \rightarrow \frac{\frac{\pi}{6}}{2}\times 9 = \frac{\pi}{12}\times 9 = \boxed{\frac{3\pi}{4}}$

ب) $\cancel{P = \alpha R \rightarrow \frac{\pi}{6}\times 3 = \frac{\pi}{2}}$

$P = 2r + \alpha r \rightarrow 2(3) + \frac{\pi}{6}(3) = 6 + \frac{\pi}{2}$

۴) الف) $S = \frac{1}{2}\times AB\times AC\times \sin\alpha \rightarrow \frac{\sqrt{3}}{2}\times\frac{1}{2}\times 5\times 8 = \boxed{10\sqrt{3}}$

ب) ضلع سوم $a = \sqrt{b^2 + c^2 - 2bc\cos\alpha} \rightarrow \sqrt{64+25-40} = 7$ محیط $= \underbrace{8+5+7}_{\boxed{20}}$

۵) $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} \rightarrow \frac{30}{1} = \frac{15\sqrt{2}}{\sin B} \rightarrow \sin\hat{B} = \frac{\sqrt{2}}{2}$

$\hat{B} = \boxed{45°} \xrightarrow{\text{رادیان}} \boxed{\frac{\pi}{4}}$

$\hat{C} = 180 - 45 - 30 = \boxed{105°} \xrightarrow{\text{رادیان}} \frac{105}{180} = \frac{R}{\pi} \rightarrow \boxed{\frac{7\pi}{12}}$

۶ ج

$$\frac{-\tan\alpha + 3\tan\alpha}{-\tan\alpha - \tan\alpha} = \frac{2\tan\alpha}{-2\tan\alpha} = \boxed{-1}$$

۷ $\tan 15° = \alpha$ $\cot 15° = \frac{1}{\alpha}$

$$\frac{2\tan 75° + \tan 105°}{3\tan 165° - \tan 255°} = \frac{2\tan(\frac{\pi}{2}-\alpha) + \tan(\frac{\pi}{2}+\alpha)}{3\tan(\pi-\alpha) - \tan(\frac{3\pi}{2}-\alpha)} =$$

۱

$$\frac{+2\cot\alpha - \cot\alpha}{-3\tan\alpha - \cot\alpha} = \frac{\cot\alpha \ \frac{1}{\alpha}}{\cancel{-\frac{3}{\cot\alpha} - \frac{\cot^2\alpha}{\cot\alpha}}} = \cancel{\frac{\cot\alpha}{\frac{-3-\cot^2\alpha}{\cot\alpha}}} = \boxed{\frac{\cot^2}{-3-\cot^2}}$$

$-\frac{3}{\cot\alpha}$

$-3\alpha - \frac{1}{\alpha}$

$\frac{-1}{3\alpha^2+1}$

۸ ۰

$$\xrightarrow{\div \sin} \frac{1+\cot}{1-\cot} + \frac{1-\cot}{1+\cot} = \frac{1+\cot^2 + \cancel{2\cot} + 1 + \cot^2 - \cancel{2\cot}}{1-\cot^2} = 3$$

$$2+2\cot^2 = 3 - 3\cot^2 \to \cot^2 = \frac{1}{5} \quad و \quad \tan^2 = 5$$

$5\cot^2 = 1$

روش درست: $3\sin^2 x + 3\cos^2 x + 7\cos^2 x = 5$

$3 + 7\cos^2 x = 5$

$\cos^2 x = \frac{2}{7}$

۹

$$\sin^2 - 2\cos^2 + 1 = 4\sin^2 + 8\cos^2 - 4$$

$$-3\sin^2 - 10\cos^2 = -5 \to 3\sin^2 + 10\cos^2 = 5$$

$\div \sin^2$ $\quad 1+\tan^2 x = \frac{1}{\cos^2 x}$

$\tan^2 x = \frac{5}{2}$

$$3 + 10\cot^2 = 5 \to 10\cot^2 = 2$$

با فرض بر $\sin^2 x$

$\sin 2x$ $\quad \cot^2 = \frac{1}{5}$ و $\tan^2 = 5$

تقسیم شود ادامه راه غلط

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۱۰

$$\cos^2\alpha = \frac{1+\cos 45°}{2} \to \frac{\frac{2}{2}+\frac{\sqrt{2}}{2}}{2} = \frac{\sqrt{2}+2}{4} \to \cos\alpha = \boxed{\frac{\sqrt{\sqrt{2}+2}}{2}} \text{ (الف}$$

۲

$$\sin^2\alpha = \frac{1-\cos 135°}{2} \to \frac{\frac{2+\sqrt{2}}{2}}{2} = \frac{2+\sqrt{2}}{4} \to \sin\alpha = \boxed{\frac{\sqrt{\sqrt{2}+2}}{2}} \text{ (ب}$$