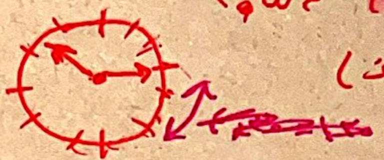
۱۷/۵

عارفه سیفی - دهم تجربی B

۱) ۳ و ۵۴

الف)



ب) ۰/۲۵

$\theta = |30H - 5/5m| \rightarrow |90 - 297| = 207$

۲)

الف) ۱

ب) $\boxed{81^\circ} = |30 \times 6 - 5/5 \times 18|$

۳)

الف) $S_{AOB} = \frac{\alpha}{2} R^2 = \frac{\frac{\pi}{6}}{2} = \frac{\pi}{12} \times 9 = \boxed{\frac{3\pi}{4}}$ ۲

ب) $|AB| = \alpha R = \frac{\pi}{6} \times 3 = \frac{\pi}{2} = \cancel{x}$ 90°

$3 + 3 + 90^\circ = \boxed{96}$ $\frac{\pi}{2} + 3 + 3$

۴) الف) $\frac{1}{2} \times 5 \times 8 \times \sin 60 \rightarrow 20 \times \frac{\sqrt{3}}{2} = S_{ABC} = \boxed{10\sqrt{3}}$

ب) ۲

$C = \sqrt{a^2 + b^2 - 2ab\cos\alpha} \rightarrow BC = \sqrt{64 + 25 - (2 \times 40 \times \frac{1}{2})}$

$BC = \sqrt{49}$

$\boxed{7}$

۵) $BC = 15$, $AC = 15\sqrt{2}$, $\hat{B} + \hat{C} = 150^\circ$

$A = 30$

$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

$\frac{15}{\frac{1}{2}} = \frac{15\sqrt{2}}{\sin B}$, $\sin B = \frac{\sqrt{2}}{2}$, $B = 45^\circ$

$\boxed{\frac{\pi}{4}} = B$

$C = 150 - 45 = 105 = \boxed{\frac{7\pi}{12}} = C$

۲

6)

$\tan(\pi-\alpha) = -\tan\alpha$

$\tan(\pi+\alpha) = +\tan\alpha$

$\tan(3\pi-\alpha) = -\tan\alpha$

$\tan(2\pi+\alpha) = \tan\alpha$

$$\rightarrow \frac{\overbrace{-\tan\alpha + 3(\tan\alpha)}^{2\tan\alpha}}{\underbrace{-\tan\alpha - (\tan\alpha)}_{-2\tan\alpha}} = \boxed{-1}$$

۲

7) $\tan\frac{\pi}{12} = a$ (15)

$$P = \frac{2\tan 75 + \tan 105}{3\tan 165 - \tan 255}$$

$75 + 15 = 90$

$\tan 75 = \cot 15 = \frac{1}{a} = \tan = \frac{1}{\cot}$

$\tan 105 = \tan(90+15) = -\cot 15 = -\frac{1}{a}$

$\tan 165 = \tan(180-15) = -\tan 15 = -a$

$\tan 255 = \tan(180+75) = \tan 75 = \frac{1}{a}$

$$\frac{2(\frac{1}{a}) - \frac{1}{a}}{3(-a) - \frac{1}{a}} = \frac{\frac{1}{a}}{\frac{-3a^2-1}{a}} = \boxed{\frac{1}{-(3a^2+1)}}$$

۲

8)

$$3 = \sin^2 x - \cos^2 x = \frac{(\sin x+\cos x)(\sin x-\cos x)^3}{(\sin x-\cos x)(\sin x+\cos x)}$$

۱,۲۵

$\tan^2 x = ? \rightarrow \tan^2 x = \frac{\sin^2 x}{\cos^2 x}$

$\sin^2 x = 3 + \cos^2 x \rightarrow \frac{3+\cos^2 x}{\cos^2 x}$

9)

$$\frac{2\sin^2 - 1}{\cos^2} = 4 = \frac{\sin^2 x - 2(1-\sin^2)+1}{\sin^2 + 2(1-\sin^2) - 1}$$

$1 - \sin^2 = \cos^2$

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

$4 - 4\sin^2 x = 2\sin^2 - 1 \rightarrow 7\sin^2 = 5$

$\boxed{\sin^2 = \frac{5}{7}}$

$-\frac{7}{7} = \frac{10}{7} - \frac{7}{7}$

$$\frac{2(\frac{5}{7}) - 1}{\frac{4}{1}} = \cos^2$$

$\boxed{\cos^2 = \frac{3}{7}}$

$$\tan^2 = \frac{\sin^2}{\cos^2} = \frac{\frac{5}{7}}{\frac{2}{7}} = \boxed{\frac{5}{2}}$$

۲

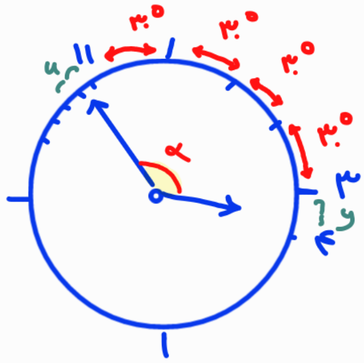
10)

الف) $\cos(22/5) \rightarrow \cos^2\alpha = \frac{1+\cos 2\alpha}{2} \rightarrow \cos(22/5) = \sqrt{\frac{1+\cos 45}{2}} = \boxed{\frac{\sqrt{2+\sqrt{2}}}{2}}$

ب) $\sin(67/5) \rightarrow \sin^2\alpha = \frac{1-\cos 2\alpha}{2} \rightarrow \sin(67/5) = \sqrt{\frac{1+\cos 45}{2}} = \boxed{\frac{\sqrt{2+\sqrt{2}}}{2}}$

1

الف)



$x = ۶^\circ$

$y = \frac{۵۴^\circ}{۲} = ۲۷^\circ$

$\alpha = ۴(۳۰^\circ) + ۲۷^\circ + ۶^\circ = \boxed{۱۵۳^\circ}$

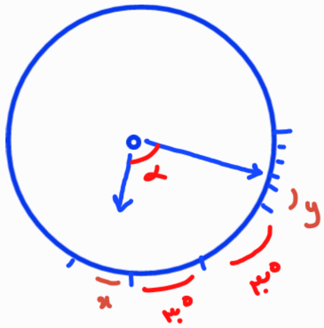
ب)

$\alpha = \left| \frac{۱۱}{۲} \times ۵۴ - ۳(۳۰) \right| = ۲۰۷^\circ$ باید زاویه را کمتر از ۱۸۰° اعلام کنیم بنابراین

$\alpha = ۳۶۰^\circ - ۲۰۷^\circ = \boxed{۱۵۳^\circ}$

2

الف)



$x = \frac{۱۸^\circ}{۲} = ۹^\circ$

$y = ۲ \times ۶^\circ = ۱۲^\circ$

$\alpha = ۲(۳۰^\circ) + ۹^\circ + ۱۲^\circ = \boxed{۸۱^\circ}$

8

$$\frac{(\sin x + \cos x)^۲ + (\sin x - \cos x)^۲}{\sin^۲ x - \cos^۲ x} = \frac{۲\overbrace{(\sin^۲ x + \cos^۲ x)}^{1}}{\sin^۲ x - \cos^۲ x} = ۳$$

$$۲ = ۳\sin^۲ x - ۳\cos^۲ x \rightarrow ۲ = ۳(۱ - \cos^۲ x) - ۳\cos^۲ x$$

$$۶\cos^۲ x = ۱ \rightarrow \cos^۲ x = \frac{۱}{۶} \rightarrow 1 + \tan^۲ x = \frac{1}{\cos^۲ x} \rightarrow \boxed{\tan^۲ x = ۵}$$