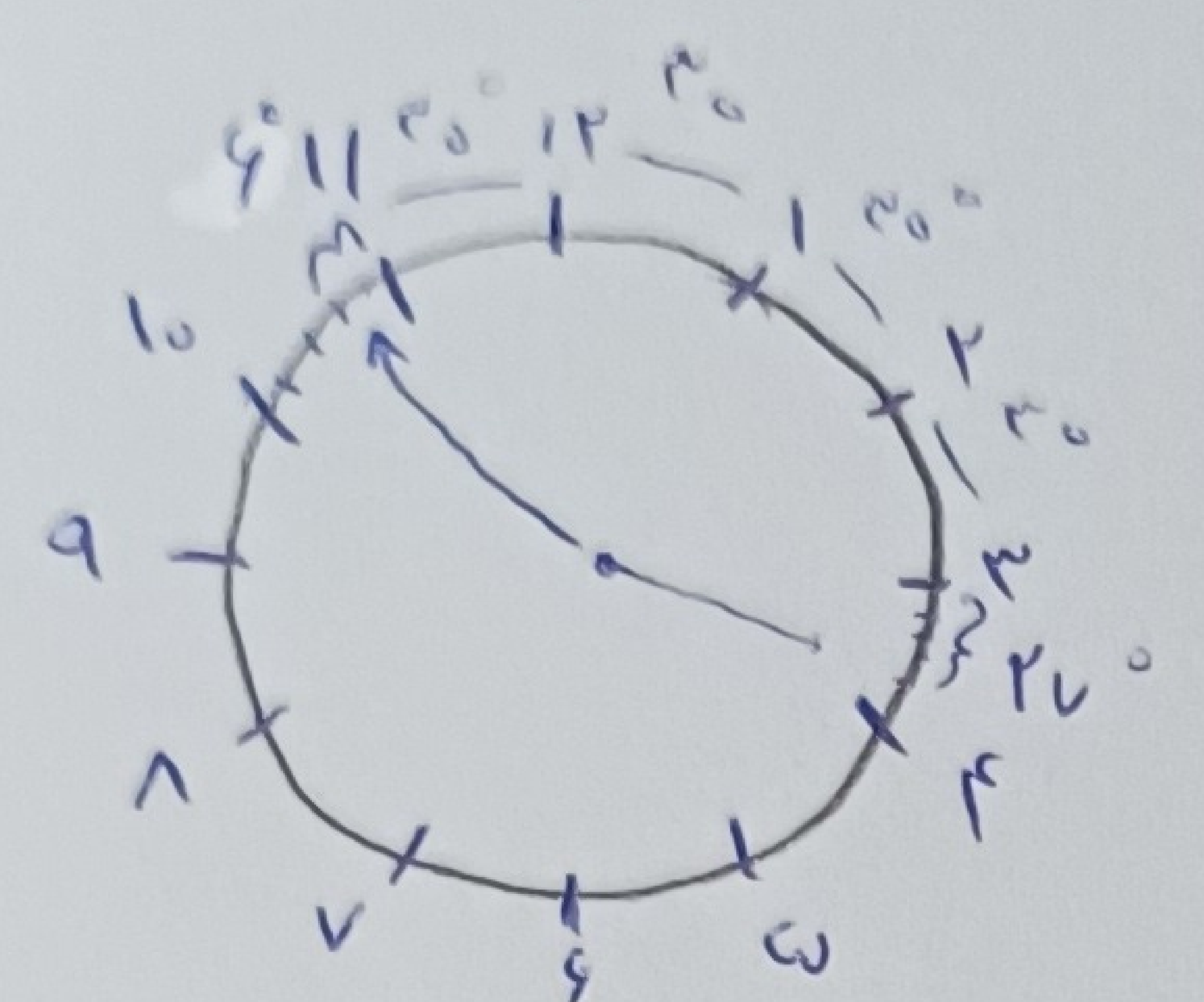
اسم دفتر A

عارف سعادت نیا

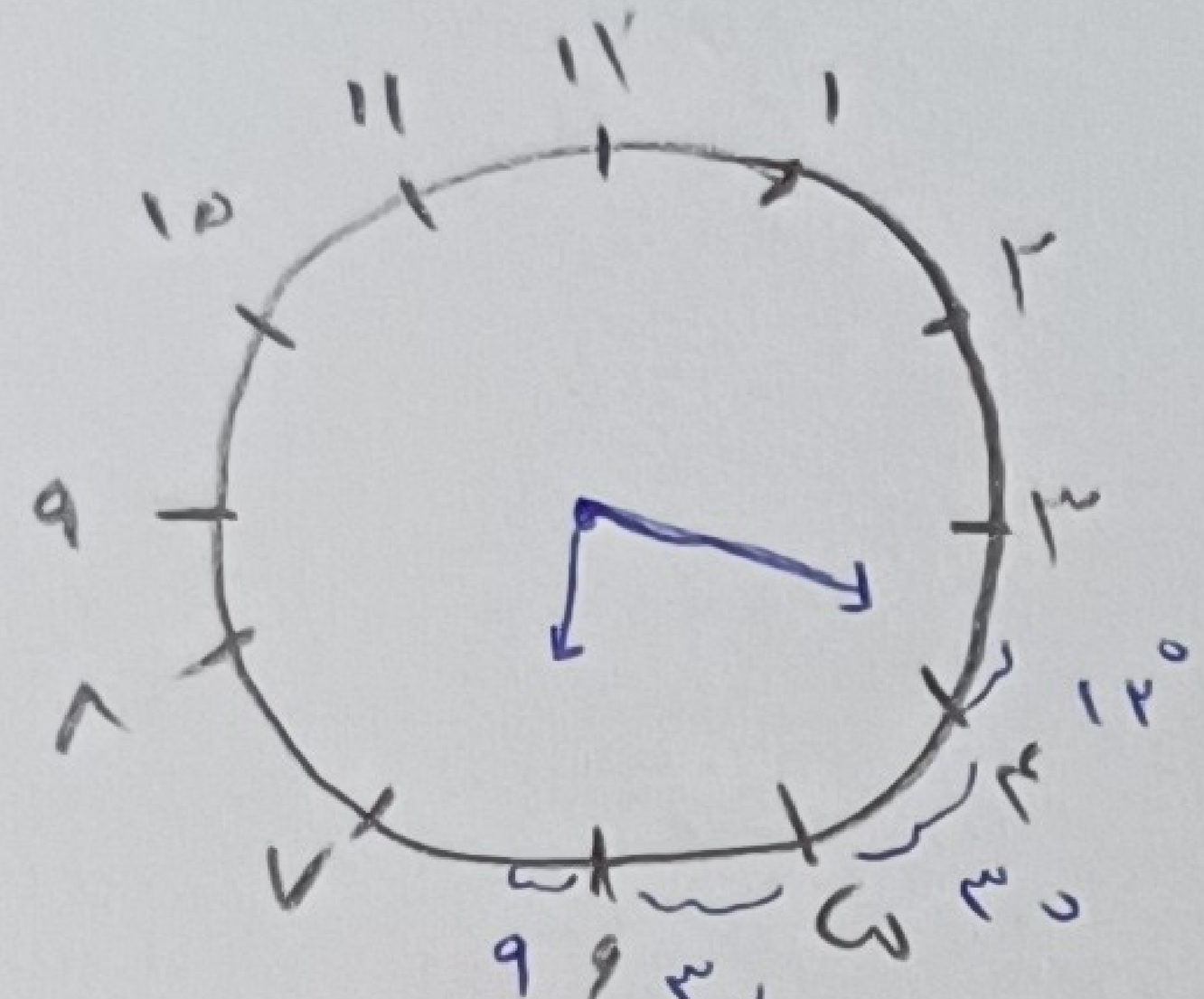
١٩,٥



١) ٥

الف) $\frac{٥٤}{٢} = ٢٧^\circ$ ساعت شمار ـ $١٢٦^\circ + ٢٧^\circ = ١٥٣^\circ$

ب) $|٥,٥ m - ٣٠ h| = |(٥,٥ \times ٥٤) - ٣٠(٣)| = ٢٠٧^\circ$

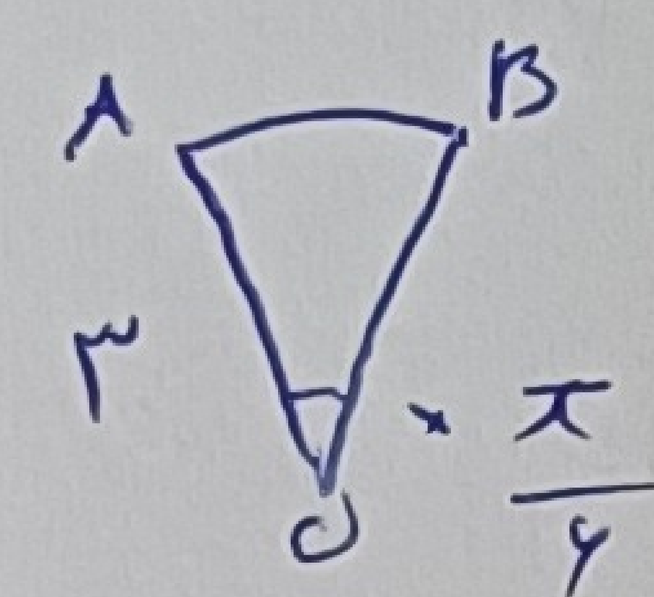


٢) ٥

ساعت شمار

$\frac{١٨}{٢} = ٩$ $\quad ٦٠ + ١٢ + ٩ = ٨١^\circ$

ب) $|٥,٥ M - ٣٠ h| = |٥,٥(١٨) - ٣٠(٦)| = |-٨١| = ٨١^\circ$



$\frac{٣\pi}{٦} = \frac{\pi}{٢}$

٣) ٥

الف) $S = \frac{\alpha}{٢} r^٢ = \frac{\frac{\pi}{٦}}{٢} \times ٣^٢ = \frac{\pi}{١٢} \times ٩ = \frac{٣\pi}{٤}$

ب) $P = ٢r + L = ٢(٣) + \frac{\pi}{٢} = ٦ + \frac{\pi}{٢} = \frac{١٢ + \pi}{٢}$

٤) ٥

الف) $\frac{١}{٢} \times ٥ \times ٨ \times \sin ٦٠^\circ = ١٠\sqrt{٣}$ $\quad (\sin ٦٠^\circ = \frac{\sqrt{٣}}{٢})$

ب) $c = \sqrt{٨^٢ + ٥^٢ - ٢(٥)(٨) \times \frac{١}{٢}} = \sqrt{٤٩} = \pm ٧ \to +٧$

طول پیاغ ق ت

$P = ٧ + ٨ + ٥ = ٢٠$

گفته برحسب رادیان

٥) ١,٥

$\frac{١٥}{\sin ٣٠} = ٣٠$ $\quad (\sin ٣٠ = \frac{١}{٢})$

$٣٠ = \frac{١٥\sqrt{٢}}{\sin B} \to \sin B = \frac{١٥\sqrt{٢}}{٣٠} \to \sin B = \frac{\sqrt{٢}}{٢}$

$B \to ٤٥^\circ$ $\quad \frac{\pi}{٤}$

$٤٥ + C = ١٥٠ \to C = ١٠٥^\circ$ $\quad \frac{٧\pi}{١٢}$

٦) ٥

$\frac{\tan(\pi - \alpha) + ٣\tan(\pi + \alpha)}{\tan(٢\pi - \alpha) - \tan(٢\pi + \alpha)} = \frac{-\tan\alpha + ٣\tan\alpha}{-\tan\alpha - (+\tan\alpha)} = \frac{٢\tan\alpha}{-٢\tan\alpha} = -١$

٧) ٥

$\frac{\pi}{١٢} \times \frac{١٨٠}{\pi} = ١٥^\circ \to \tan ١٥^\circ = a$

$A = \frac{٢\tan ٧٥^\circ + \tan ١٠٥^\circ}{٣\tan ١٦٥^\circ - \tan ٢٥٥^\circ} = \frac{٢\tan(٩٠^\circ - ١٥^\circ) + \tan(٩٠^\circ + ١٥^\circ)}{٣\tan(١٨٠^\circ - ١٥^\circ) - \tan(٢٧٠^\circ - ١٥^\circ)} =$

$\frac{٢\tan(\frac{\pi}{٢} - ١٥) + \tan(\frac{\pi}{٢} + ١٥)}{٣\tan(\pi - ١٥) - \tan(\frac{٣\pi}{٢} - ١٥)} \to \frac{٢\cot ١٥^\circ - \cot ١٥^\circ}{-٣\tan ١٥^\circ - \cot ١٥^\circ} \xrightarrow{١٥^\circ = a} \frac{٢(\frac{١}{a}) - \frac{١}{a}}{-٣(a) - \frac{١}{a}} = \frac{\frac{١}{a}}{٣a - \frac{١}{a}} = \frac{١}{-٣a^٢ - ١} =$

$\frac{١}{٣a^٢ + ١}$

٨) ٥

$\frac{(\sin x + \cos x)^٢ + (\sin x - \cos x)^٢}{\sin^٢ x - \cos^٢ x} = ٣ \to \frac{\sin^٢ x + \cos^٢ x + ٢\sin x\cos x + \sin^٢ x + \cos^٢ x - ٢\sin x \cos x}{\sin^٢ x - \cos^٢ x} = \frac{٢}{\sin^٢ x - \cos^٢ x} = ٣$

$\frac{١}{\sin^٢ x - \cos^٢ x} = \frac{٣}{٢} \to \sin^٢ x - \cos^٢ x = \frac{٢}{٣} \to \cos^٢ x = -\frac{٢}{٣}$ $\quad (\sin^٢ x - \cos^٢ x = -\cos^٢ x)$

$\tan^٢ x = \frac{١ - \cos^٢ x}{١ + \cos^٢ x} = \frac{١ - (-\frac{٢}{٣})}{١ + (-\frac{٢}{٣})} = \frac{\frac{٥}{٣}}{\frac{١}{٣}} = ٥$

۹ ۲

$$\frac{\sin^2\alpha - 2\cos^2\alpha + 1}{\sin^2\alpha + 2\cos^2\alpha - 1} = \frac{1 - \cos^2\alpha - 2\cos^2\alpha + 1}{1 - \cos^2\alpha + 2\cos^2\alpha - 1} - \frac{-3\cos^2\alpha + 2}{\cos^2\alpha} = 4$$

$$4\cos^2\alpha = -3\cos^2\alpha + 2 \rightarrow 7\cos^2\alpha = 2 \rightarrow \cos^2\alpha = \frac{2}{7} \qquad 1 + \tan^2\alpha = \frac{1}{\frac{2}{7}} = \frac{7}{2} - 1 = \frac{5}{2}$$

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

۱۰ ۵

الف) $\cos(22,5^\circ) \rightarrow \cos^2\alpha = \frac{1+\cos 2\alpha}{2} \rightarrow \cos^2 22,5^\circ = \frac{1+\cos 45^\circ}{2} = \frac{1+\frac{\sqrt{2}}{2}}{2} = \frac{\frac{2+\sqrt{2}}{2}}{2} = \frac{2+\sqrt{2}}{4} \rightarrow \cos^2 22,5 = \frac{2+\sqrt{2}}{4} \rightarrow \cos 22,5 = \pm\frac{\sqrt{2+\sqrt{2}}}{2}$

لغ ق ق عاصیا

ب) $\sin(67,5^\circ) \rightarrow \sin^2\alpha = \frac{1-\cos 2\alpha}{2} \rightarrow \sin^2 67,5 = \frac{1-\cos 135^\circ}{2} = \frac{1-(-\frac{\sqrt{2}}{2})}{2} = \frac{\frac{2+\sqrt{2}}{2}}{2} = \frac{2+\sqrt{2}}{4} \rightarrow$

$\sin^2\alpha = \frac{2+\sqrt{2}}{4} \rightarrow \sin 67,5^\circ = \pm\frac{\sqrt{2+\sqrt{2}}}{2}$

لغ ق ق عاصیا