

الف) $\frac{D}{180^\circ} = \frac{rad}{\alpha} = \frac{G}{r}$

ب) $180^\circ = (\infty) rad$

ج) $\frac{\omega \alpha}{12} rad = (\infty)^\circ$

د) $\frac{r \alpha}{9} rad = (\infty)^\circ$

$\frac{12 \alpha}{180} = \frac{rad}{\alpha}$

$\frac{12 \alpha \pi}{180} = \frac{2 \alpha \pi}{45}$
 $rad = 180^\circ = 1, 44 \alpha$

$\frac{\omega}{12} \alpha = \frac{D}{180}$

$\frac{\omega}{12} \times 180 = D = 15 \alpha^\circ$

$\frac{r \alpha}{9} = \frac{D}{180}$

$= \frac{r}{9} = \frac{D}{180}$

$D = \frac{180 \times r}{9} = 20 \alpha^\circ$

$(1. \alpha)^\circ, \frac{12 \alpha \alpha}{9} G, \frac{\alpha \alpha}{\alpha} rad$

$\left(\frac{\frac{12 \alpha \alpha}{9}}{\frac{r \alpha \alpha}{1}} \right) = \frac{\frac{12 \alpha \omega}{r \alpha \alpha} \alpha}{\frac{r \alpha \alpha}{1}} = \frac{D}{180^\circ} \rightarrow D = \frac{12 \alpha \omega}{r \alpha \alpha} \times 180^\circ = 112, 2 \alpha^\circ$

$\frac{\alpha \alpha}{\frac{r}{1}} = \frac{D}{180} \quad \frac{\alpha}{\alpha} = \frac{D}{180} \quad D = (24, 2 \alpha)^\circ$

$1. \alpha + 24, 2 \alpha + 112, 2 \alpha = 218. \alpha$

$\alpha = 1, 44$

الف) $\left(\frac{1}{r} \times \frac{\sqrt{r}}{r} \right) - \left(\frac{\sqrt{r}}{r} \times \frac{1}{r} \right) = \left(1 + r \right) = \sqrt{r}$

ب) $\frac{\left(\frac{1}{\sqrt{r}} \right)^2 + 1 + (\sqrt{r})^2}{\sqrt{r} - \frac{1}{\sqrt{r}}} = \frac{\frac{1}{r} + 1 + r}{\frac{r-1}{\sqrt{r}}} = \frac{\frac{1+r}{r} + 1}{\frac{r-1}{\sqrt{r}}} = \frac{1+r}{r} \times \frac{\sqrt{r}}{r-1} = \frac{1+r}{r} \times \frac{\sqrt{r}}{r-1}$

$\frac{1}{r} + 1 + r = \frac{1+r}{r} + 1 = \frac{1+r+r}{r} = \frac{1+2r}{r}$

$\frac{1+r}{r} \times \frac{\sqrt{r}}{r-1}$

$\tan \theta = \frac{1}{\sqrt{r}}$
 $\tan \theta = \sqrt{r}$
 $\tan \theta = 1$
 $\cot \theta = \frac{1}{\sqrt{r}}$

$\left(-\frac{1}{r} \times \frac{1}{r} \right) + \left(\frac{\sqrt{r}}{r} \times \frac{\sqrt{r}}{r} \right) = \sin^2 \theta$
 $-\frac{1}{r} + \frac{r}{r} = \frac{r}{r} = 1$

$\sin^2 \theta = \frac{1}{r} \rightarrow \sin \theta = \frac{1}{\sqrt{r}} \rightarrow \sin \theta = \frac{1}{\sqrt{r}} = \frac{1}{\sqrt{r}} \rightarrow \sin \theta = \frac{1}{\sqrt{r}}$

$\tan \theta = \frac{\sqrt{r}}{r} = \frac{1}{\sqrt{r}}$

$\theta = 45^\circ$

$\frac{r \left(\frac{1}{\sqrt{r}} \right) \left(1 - \frac{1}{r} \right)}{\left(1 - \frac{1}{r} \right)}$

$= \frac{r}{\sqrt{r}} \times \frac{\sqrt{r}}{\sqrt{r}} = \frac{r \sqrt{r}}{\sqrt{r}}$

$r \tan \theta = \tan \theta$

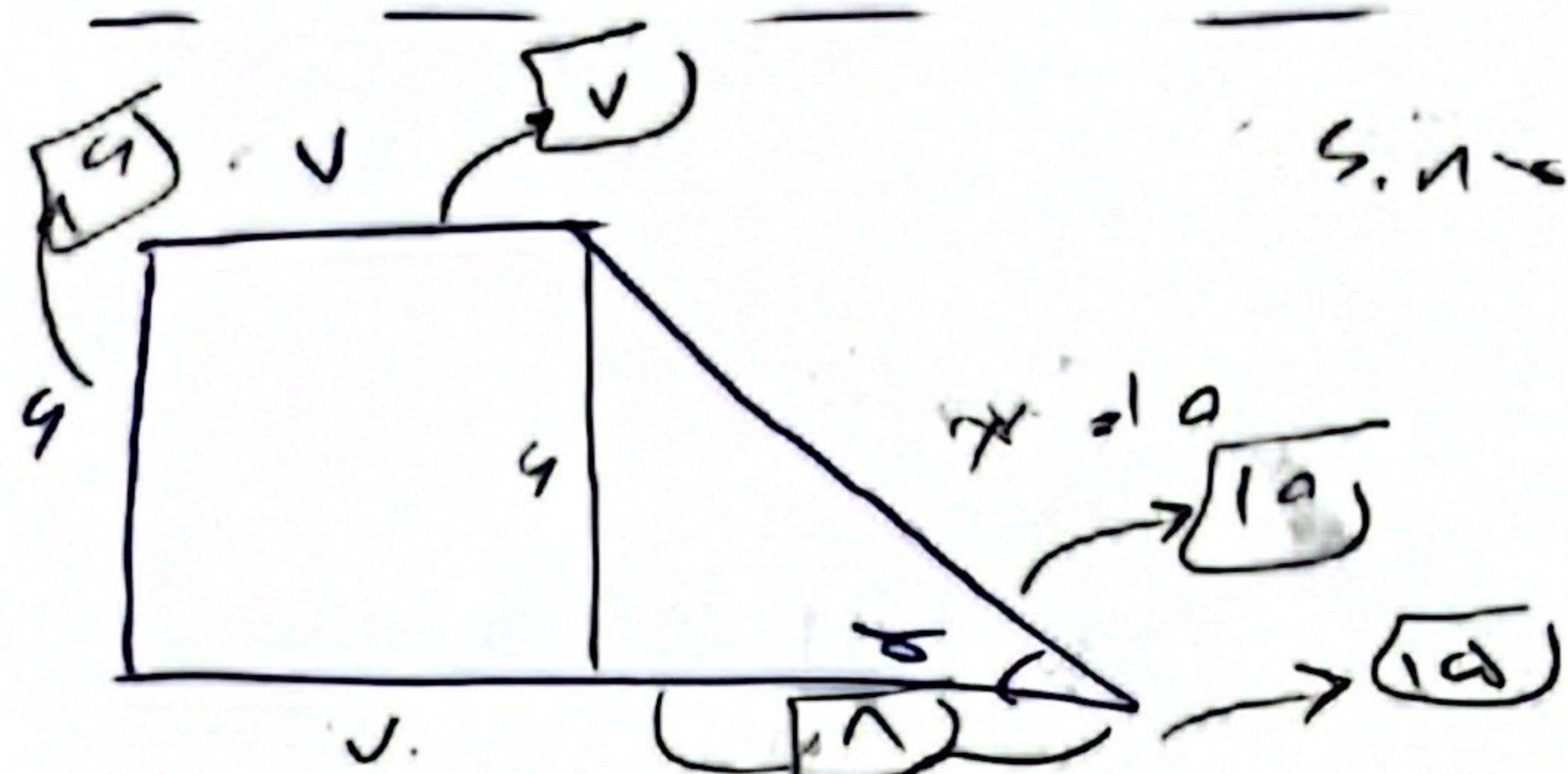
(5)

$\frac{\sin \theta}{\cos \theta} = \frac{r \sqrt{r}}{\sqrt{r}} = r (\tan \theta)$

$$\frac{\sin \theta}{\cos \theta} = \omega$$

$$\sin \theta = \omega \cos \theta$$

$$\frac{2(\omega \cos \theta) - \cos \theta}{\omega \cos \theta - \cos \theta} = \frac{1 \cos \theta}{\cos \theta} \quad \boxed{14}$$

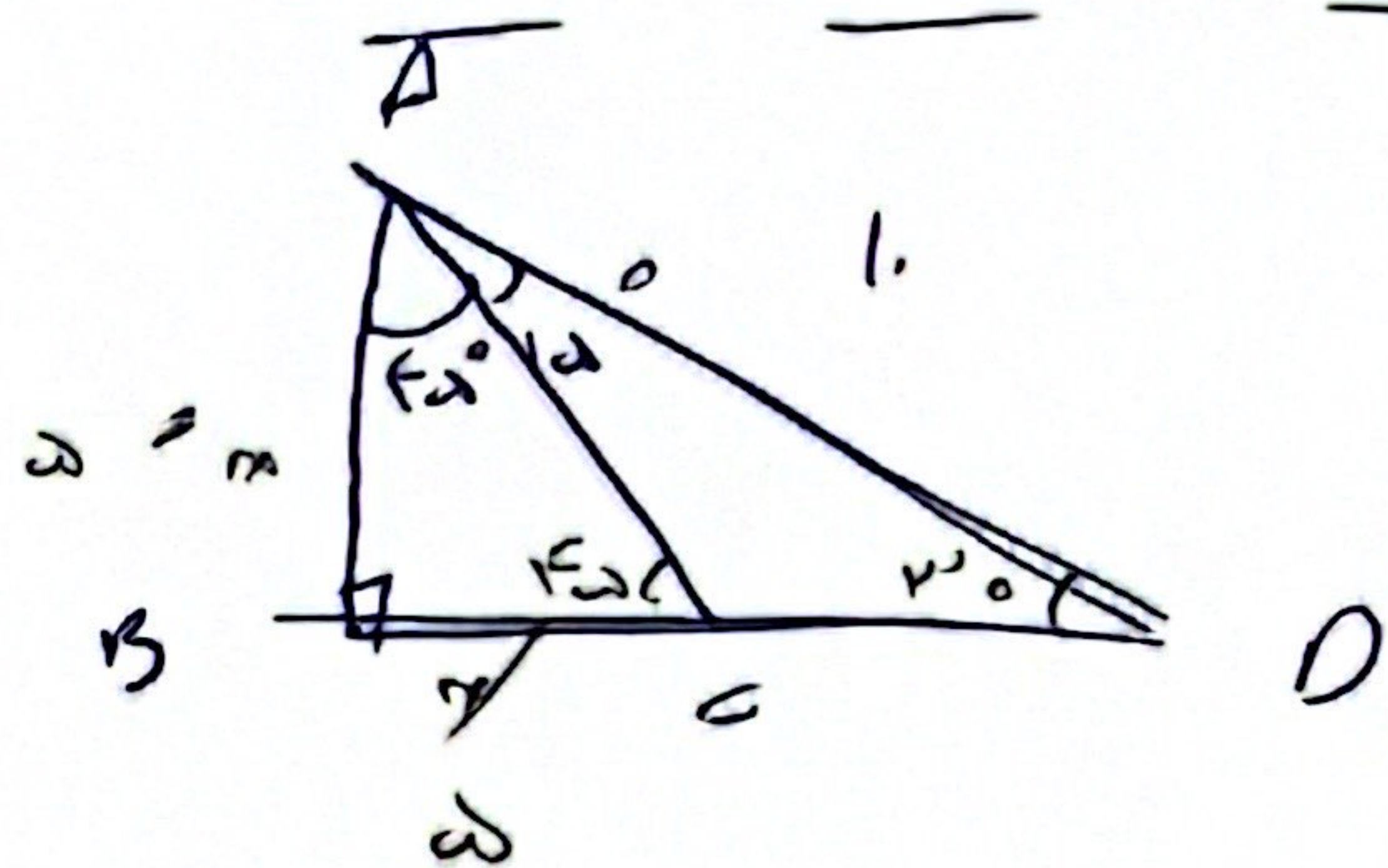


$$\sin \alpha = \frac{\text{ضلع مقابل}}{\text{وتر}} = \frac{4}{10} = \frac{2}{5}$$

$$\alpha = 10$$

$$\text{محيط} = 10 + 10 + 4 + 4 = 38$$

$$100 - 34 = 66 \quad \sqrt{66} = 8$$



$$\sin 30^\circ = \frac{1}{2} = \frac{\alpha}{10} \rightarrow \alpha = 5$$

$$\frac{\omega}{\omega + c} = \tan 30^\circ = \frac{1}{\sqrt{3}}$$

$$\omega \sqrt{3} = \omega + c$$

$$\omega \sqrt{3} - \omega = c$$

$$c = \omega \sqrt{3} - \omega$$

$$\omega (\sqrt{3} - 1) = c$$

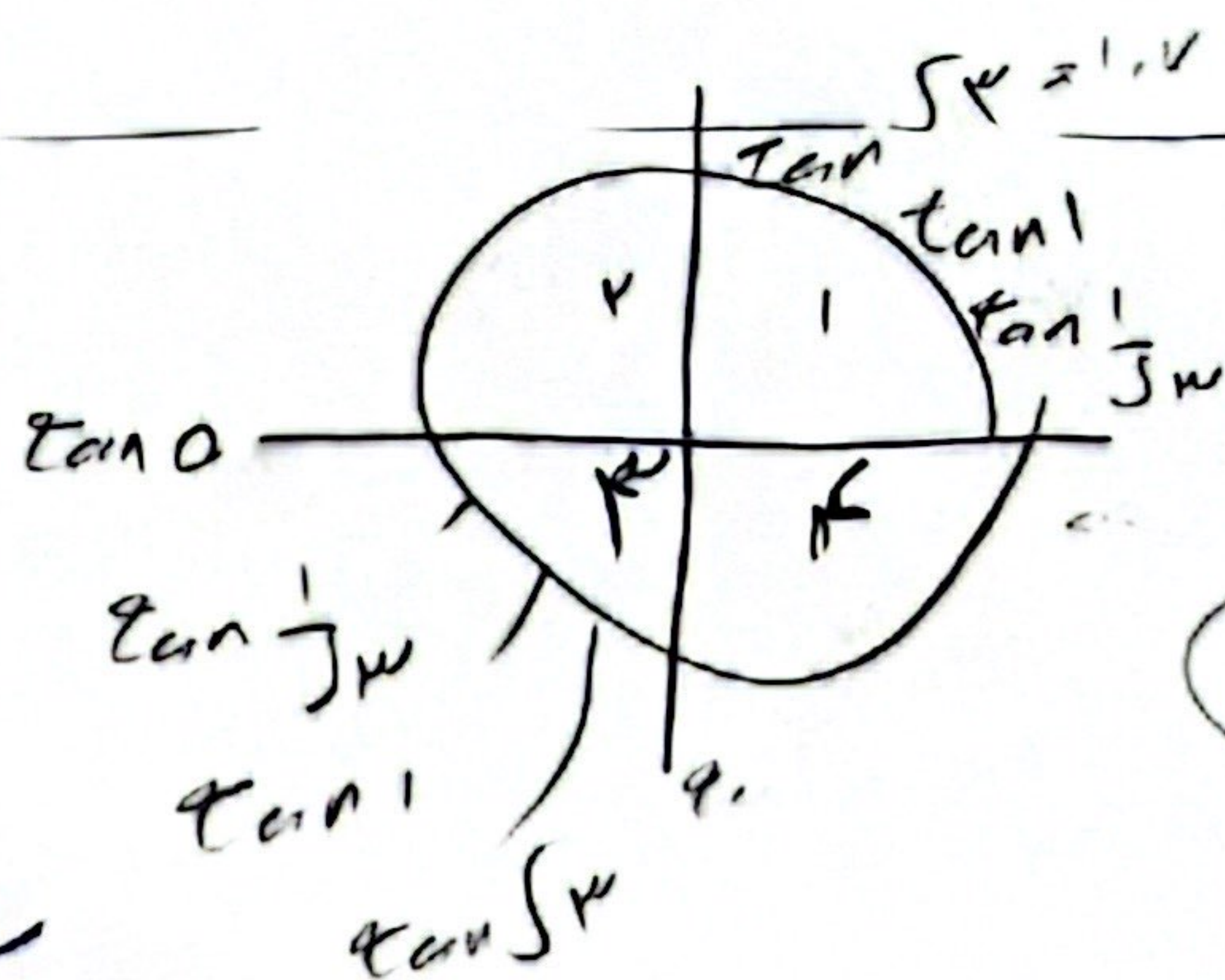
خاصیت اول (الف)

الف) در ناحیه دوم $\sin \alpha$ از 0 به منفی یک می‌رود پس $\sin \alpha$ می‌باشد و $\cos \alpha$ از 1 به صفر می‌رسد پس $\cos \alpha$ می‌باشد

ب) خاصیت دوم

ب) در ناحیه دوم $\sin \alpha$ از 1 به صفر می‌رسد پس $\sin \alpha$ می‌باشد و $\cos \alpha$ از 0 به 1 می‌رسد پس $\cos \alpha$ می‌باشد

$$\tan \alpha = \frac{1}{\sqrt{3}}$$



$$0 \leq \tan \frac{1}{\sqrt{3}} < 1$$

$$0 < \sin \alpha < \frac{\sqrt{3}}{2}$$

درست است

سوالات تلف ساده بود اگر با وجود وقت گذاشتن باز هم اشکال دارید تا هم رفع اشکال بگیرید!

۱۰ کمان در نصف دایره است بین $\cos u$ و $\sin u$

$$1 + \tan^2 u = \frac{1}{\cos^2 u} \rightarrow 1 + \frac{1}{9} = \frac{1}{\cos^2 u} \rightarrow \cos^2 u = \frac{9}{10}$$

$$\sin^2 u = 1 - \cos^2 u \rightarrow \sin^2 u = 1 - \frac{9}{10} = \frac{1}{10} \rightarrow \sin u = \pm \frac{\sqrt{10}}{10}$$

$$\sin u = -\frac{\sqrt{10}}{10} \leftarrow \sin u < 0$$

سوال ۲

$$\frac{D}{10} = \frac{G}{20} = \frac{\text{Rad}}{\pi} \rightarrow \frac{\frac{a\pi}{1}}{\pi} = \frac{D_1}{10} \rightarrow D_1 = \frac{10}{1} a = 44, \Delta a^\circ$$

$$\frac{14\Delta a}{9} = \frac{D_2}{10} \rightarrow D_2 = 14, \Delta a^\circ$$

$$14, \Delta a^\circ + 44, \Delta a^\circ + 10 \cdot a^\circ < 180^\circ \rightarrow 58 \Delta a < 180^\circ \rightarrow a < 3^\circ$$

سوال ۳ - ب

$$\frac{\tan^2 30^\circ + \tan^2 60^\circ + \tan^2 45^\circ}{\cot^2 30^\circ - \cot^2 45^\circ} = \frac{\frac{1}{3} + 1 + 3}{\sqrt{3} - \frac{\sqrt{3}}{3}}$$

$$\frac{\frac{1+3+9}{3}}{\frac{3\sqrt{3}-\sqrt{3}}{3}} = \frac{13}{2\sqrt{3}} = \boxed{\frac{13\sqrt{3}}{6}}$$

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$$\frac{2 \tan^2 \theta (1 - \tan^2 \theta)}{(1 - \cot^2 \theta)^2} = \frac{2 \frac{\sqrt{3}}{3} (1 - \frac{1}{3})}{(1 - \frac{1}{3})^2} = \frac{2 \frac{\sqrt{3}}{3}}{\frac{4}{9}} = \sqrt{3}$$

$$\tan \theta < \sqrt{3} \rightarrow \theta < \frac{\pi}{3} < 45^\circ$$

