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الف) $-1 + (-\frac{\sqrt{r}}{r}x - \frac{\sqrt{r}}{r}) = -\frac{1}{r}$ ✓

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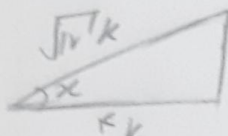
ب) $-\frac{\sqrt{r}}{r}x - \frac{\sqrt{r}}{r} + (-\frac{1}{r}) = 0$ ✓

$\cot x = r = \frac{r}{\tan x}$

$\frac{r \times \frac{r}{\sqrt{14}} - \frac{1}{\sqrt{14}}}{\frac{r}{\sqrt{14}} + \frac{1}{\sqrt{14}}} = \frac{11}{\omega}$ ✓

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 $\Rightarrow \sin x = \frac{1}{\sqrt{14}}$
 $\Rightarrow \cos x = \frac{r}{\sqrt{14}}$

$\frac{r \times \frac{r}{\sqrt{14}} + \frac{1}{\sqrt{14}}}{\frac{r}{\sqrt{14}} - \frac{1}{\sqrt{14}}} = \frac{11}{\omega}$ ✓

$\sin a = r \cos a$

$\Rightarrow \sin^2 a = r^2 \cos^2 a$

$\sin^2 a + \cos^2 a = 1 \Rightarrow \omega \cos^2 a = 1 \Rightarrow \cos^2 a = \frac{1}{\omega} \Rightarrow \cos a = -\frac{1}{\sqrt{\omega}}$ ✓

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الف) $\sin a = \frac{\sqrt{r}}{1} \Rightarrow 140^\circ < a < 180^\circ$

$\frac{11\pi}{r} = 39.4 + 140^\circ$

$\Rightarrow \cos(\frac{11\pi}{r} + a) = -\cos a$

$\frac{r}{1} + \cos^2 a = 1$

$\Rightarrow \cos^2 a = \frac{91}{1} \Rightarrow \cos a = -\frac{\sqrt{91}}{1} \Rightarrow \cos(\frac{11\pi}{r} + a) = \frac{\sqrt{91}}{1}$ ✓

جواب منفی است

$\tan a = \frac{1}{\sqrt{r}} \Rightarrow 0 < a < 90^\circ$

~~$\Rightarrow \sin(\frac{11\pi}{r} + a) = -\cos a$~~

$\tan^2 a + 1 = \frac{1}{\cos^2 a} \Rightarrow \frac{1}{r} + 1 = \frac{\omega}{r} = \frac{1}{\cos^2 a}$

$\Rightarrow \cos^2 a = \frac{r}{\omega} \Rightarrow \cos a = \frac{\sqrt{r}}{\sqrt{\omega}}$ ✓

~~$\Rightarrow \sin(\frac{11\pi}{r} + a) = \frac{\sqrt{r}}{\sqrt{\omega}}$~~

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

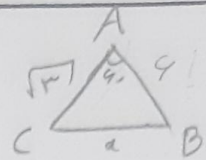
$\Rightarrow \sin^2 x + \sin^2 x + \cos^2 x = \frac{r}{r} \Rightarrow \sin^2 x = \frac{1}{r} \Rightarrow \cos^2 x = \frac{r}{r}$

$\tan^2 x = \frac{1}{r} = \frac{1}{r}$ ✓

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$$\frac{1}{r} \times r \times \sqrt{r} \times \sin A = r/\omega \Rightarrow \sin A = \frac{r/\omega}{r\sqrt{r}} = \frac{1/\omega}{\sqrt{r}} = \frac{\sqrt{9}}{\sqrt{r}} = \frac{\sqrt{r}}{r} \Rightarrow A = 9^\circ$$



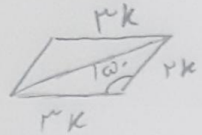
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$$A+B+C=180^\circ \Rightarrow B+C+9^\circ=180^\circ \Rightarrow B+C=171^\circ$$

$$\frac{a}{\frac{\sqrt{r}}{r}} = \frac{r}{\sin C} = \frac{\sqrt{r}}{\sin B} \Rightarrow \left. \begin{aligned} a \sin C &= r\sqrt{r} \\ a \sin B &= \frac{r}{r} \end{aligned} \right\} \begin{aligned} a_{\max} &= r \\ a_{\min} &= \frac{r}{r} \end{aligned}$$

مانبت $\frac{\alpha_{\max}}{\alpha_{\min}}$ رو می خوایم نه α !

$$\frac{A_{\max}}{A_{\min}} = \boxed{r}$$



$$r \times r \times r \times \frac{1}{r} \times \sin 10^\circ = r^2 k^2 = \omega^2 \Rightarrow k^2 = 1 \Rightarrow k = r\sqrt{r}$$

$$l \cdot k = l \cdot r\sqrt{r} = \boxed{r \cdot \sqrt{r}} \quad \checkmark$$

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$$\left(\frac{1}{r} \times v \times r \times \sin A\right) + 1/v\omega = \frac{1}{r} \times v \times \omega \times \sin A$$

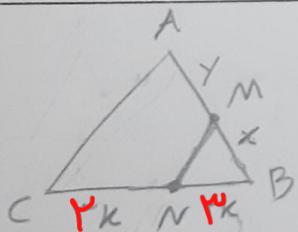
$$\frac{1}{r} \times v \times \sin A = 1/v\omega$$

$$\Rightarrow r/\omega \sin A = 1/v\omega$$

$$\Rightarrow \sin A = \frac{1}{r} \Rightarrow A = 3^\circ$$

$$\tan r = \frac{1}{\sqrt{r}} \quad \checkmark$$

2



$$\triangle ABC = \frac{1}{r} \times (y+x) \times \omega k \times \sin B$$

$$\triangle BNM = \frac{1}{r} \times x \times r k \times \sin B$$

$$r \times \frac{1}{r} \times x \times r k \times \sin B = \frac{1}{r} \times (x+y) \times \omega k \times \sin B$$

$$\Rightarrow \frac{r \times \frac{1}{r} \times x \times r k \times \sin B}{\frac{1}{r} \times (x+y) \times \omega k \times \sin B} = \frac{\omega x + \omega y}{\omega x + \omega y} = 1 \Rightarrow \omega x = \omega x + \omega y = kx = \omega y$$

$$\frac{BM}{AM} = \frac{x}{y} = \frac{\frac{\omega}{r} y}{y} = \boxed{\frac{\omega}{r}}$$

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$$\frac{1}{\sqrt{\cos a}} - \tan a = \frac{1 + \sin a}{|\cos a|} \Rightarrow \frac{1}{|\cos a|} - \frac{\sin a}{\cos a} = \frac{1 + \sin a}{|\cos a|} \Rightarrow \frac{-\sin a}{|\cos a|} = \frac{\sin a}{\cos a} \Rightarrow \cos a < 0$$

$$\frac{|\sin a|}{\cos a} = -\frac{1}{\cot a} \Rightarrow \frac{|\sin a|}{\cos a} = -\frac{\sin a}{\cos a} \Rightarrow \sin a < 0$$

$$\left. \begin{aligned} \cos a &< 0 \\ \sin a &< 0 \end{aligned} \right\} \text{مربعی} \quad \checkmark$$

2

1.

الف) $\cos^2 \alpha = 1 - \sin^2 \alpha \rightarrow \cos^2 \alpha = \frac{9}{10} \xrightarrow{\text{جذر}} \cos \alpha = -\frac{\sqrt{2}}{10}$ (✓)

$$\cos\left(\frac{11\pi}{4} + \alpha\right) = \cos\left(3\pi + \left(-\frac{\pi}{4} + \alpha\right)\right) = -\cos\left(\alpha - \frac{\pi}{4}\right)$$

$$= -\left(\cos \alpha \cos \frac{\pi}{4} + \sin \alpha \sin \frac{\pi}{4}\right) = -\left(-\frac{\sqrt{2}}{10} \times \frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{10} \times \frac{\sqrt{2}}{2}\right) = \frac{2}{5}$$

ب) $1 + \frac{\tan^2 \alpha}{\frac{1}{49}} = \frac{1}{\cos^2 \alpha} \xrightarrow{\text{جذر}} \cos \alpha = \frac{\sqrt{2}}{10} \xrightarrow{\sin^2 \alpha + \cos^2 \alpha = 1} \sin \alpha = \frac{\sqrt{2}}{10}$

$$\sin\left(\frac{13\pi}{4} + \alpha\right) = \sin\left(3\pi + \frac{\pi}{4} + \alpha\right) = -\sin\left(\frac{\pi}{4} + \alpha\right) \xrightarrow{\text{مشتق}} -\frac{2}{5}$$