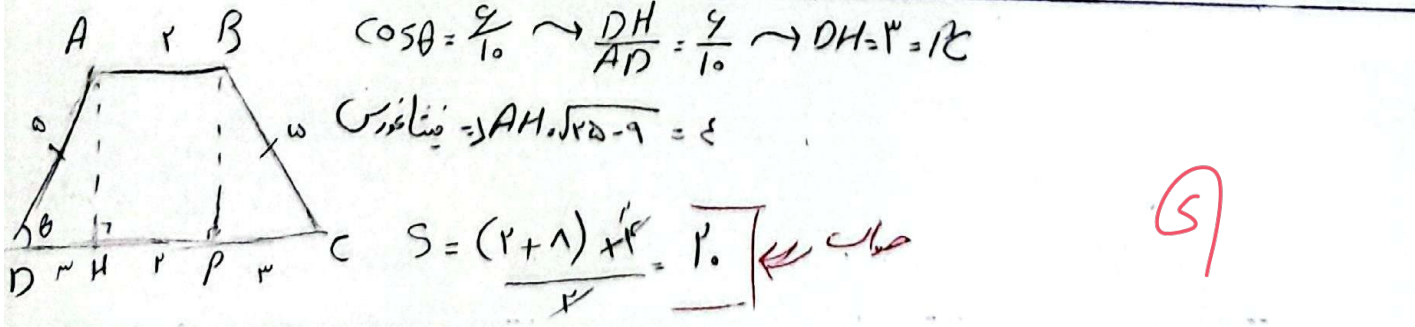


$\frac{1}{\sqrt{\cos^2 \alpha}} - \frac{1}{\cot \alpha} = \frac{1 - \sin \alpha}{|\cos \alpha|}$
 $\frac{1}{|\cos \alpha|} - \tan \alpha = \frac{1}{|\cos \alpha|} - \frac{\sin \alpha}{|\cos \alpha|} \Rightarrow \frac{\sin \alpha}{|\cos \alpha|} = \tan \alpha \rightarrow \cos \alpha > 0$ ①
 $\cot \alpha = \frac{\cos \alpha}{\sqrt{1 - \cos^2 \alpha}} = \frac{\cos \alpha}{\sqrt{\sin^2 \alpha}} = \frac{\cos \alpha}{|\sin \alpha|} \rightarrow \frac{\cos \alpha}{\sin \alpha} = \frac{\cos \alpha}{|\sin \alpha|} \rightarrow \sin \alpha > 0$ ②

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$\sin^2 x = \frac{m-1}{f}$, $\frac{\pi}{11} < x < \frac{2\pi}{11} \rightarrow -\frac{\pi}{5} < x < \frac{2\pi}{5} \rightarrow -\frac{1}{5} < \sin x \leq 1$
 $\rightarrow -\frac{1}{5} < \frac{m-1}{f} \leq 1 \rightarrow -1 < m-1 \leq f \rightarrow -1 < m \leq f+1 \rightarrow [-1, 5]$

① $\tan x + \cot x = -\frac{1}{\sqrt{2}}$, $\frac{\pi}{2} < x < \frac{3\pi}{2} \rightarrow \textcircled{1} = \frac{\cos^2 x + \sin^2 x}{\sin x \cos x} = -\frac{1}{\sqrt{2}} \rightarrow \sin x \cos x = -\frac{1}{\sqrt{2}}$
 $\frac{1}{\sin^2 x + \cos^2 x} = \frac{1}{(\sin x + \cos x)(\sin x - \cos x)} = \frac{1}{-\frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}}} = \frac{-\sqrt{2}}{0}$
 ② $(\sin x + \cos x)^2 = \sin^2 x + \cos^2 x + 2 \sin x \cos x = 1 + 2(-\frac{1}{\sqrt{2}}) = 1 - \sqrt{2} \rightarrow \sin x + \cos x = \pm \sqrt{1 - \sqrt{2}}$
 ③ $\frac{\pi}{2} < x < \frac{3\pi}{2} \rightarrow \frac{\pi}{2} < x < \frac{3\pi}{2} \rightarrow \frac{1}{\sqrt{2}} < \sin x < 1$



$\tan(\pi + \alpha) \tan(\pi + \beta) - \sin(\pi + \alpha) \cos(\pi + \beta)$
 $\tan(\pi + \alpha) \tan(\pi + \beta) - \sin(\pi + \alpha) \cos(\pi + \beta)$
 $\rightarrow (-\cot \alpha) (\cot \beta) - (-\sin \alpha) (-\cos \beta) = -1 + \sin^2 \alpha = -(1 - \sin^2 \alpha)$
 $= -\cos^2 \alpha = k \cos^2 \alpha \rightarrow k = -1$

$$A = \sqrt{r} \cos(\pi/6) \sin(\pi/4) - \sqrt{r} \sin(\pi/6) \cos(\pi/4) =$$

$$A = \sqrt{r} (\cos \pi/6 \sin \pi/4 - \sin \pi/6 \cos \pi/4) =$$

$$= \sqrt{r} (-\cos \pi/6) (-\cos \pi/4) - \sqrt{r} (\sin \pi/6) (-\cos \pi/4) = \sqrt{r} \left(\frac{\sqrt{3}}{2}\right) (\cos \pi/4) + \sqrt{r} \frac{1}{2} (\cos \pi/4)$$

$$= \frac{\omega}{r} (\cos \pi/4) \Rightarrow \frac{\omega}{r} \cos \pi/4 = \frac{\omega}{r} \left[\frac{1}{\sqrt{2}} \right] \leftarrow \text{جواب}$$

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$$f(x) = 14 \cos^2(3x) \cos^2(4x) \cos^2(12x) \cos^2(\pi/4 x)$$

$$f\left(\frac{\pi}{12}\right)$$

$$f\left(\frac{\pi}{12}\right) = 14 \cos^2\left(\frac{\pi}{4}\right) \cos^2\left(\frac{\pi}{3}\right) \cos^2\left(\frac{\pi}{6}\right) \cos^2\left(\frac{\pi/12}{4}\right)$$

$$14 \times \frac{\sqrt{3}+\sqrt{3}}{2} \times \left(\frac{1}{2}\right) \times \frac{1}{2} \times -\frac{1}{2} = \frac{-4+3\sqrt{3}}{16} \leftarrow \text{جواب}$$

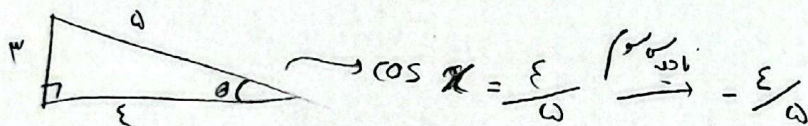
$$\cos^2\left(\frac{\pi}{12}\right) = \cos^2 15^\circ = \frac{1+\cos 30^\circ}{2}$$

$$\cos 15^\circ = \frac{(\sqrt{29} + \sqrt{3})}{2} = \frac{r+\sqrt{r}}{e}$$

$$\frac{1 - \sin x}{1 + \sin x} = k$$

$$\tan \frac{x}{2} = ? \rightarrow \tan \frac{x}{2} = \frac{\sin x}{1 + \cos x} = \frac{-\frac{r}{\omega}}{1 - \frac{r}{\omega}} = -k \leftarrow \text{جواب}$$

$$1 - \sin x = k + k \sin x \rightarrow -r = \omega \sin x \rightarrow \sin x = -\frac{r}{\omega}$$



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$$\frac{\sin \theta}{1 - \cos \theta} + \frac{1 + \cos \theta}{\sin \theta} = k \cot \frac{\theta}{2}$$

$$\textcircled{1} \frac{\sin \theta}{1 + \cos \theta} = \tan \frac{\theta}{2} \xrightarrow{\text{ضرب}} \frac{1 + \cos \theta}{\sin \theta} = \cot \frac{\theta}{2}$$

$$\textcircled{2} \frac{1 - \cos \theta}{\sin \theta} = \tan \frac{\theta}{2} \xrightarrow{\text{ضرب}} \frac{\sin \theta}{1 - \cos \theta} = \cot \frac{\theta}{2}$$

$$\cot \frac{\theta}{2} + \cot \frac{\theta}{2} = 2 \cot \frac{\theta}{2}$$

$$k = 2 \leftarrow \text{جواب}$$

$$\cos\left(\frac{11\pi}{6} + \alpha\right) = \cos \alpha + \sin \alpha = 1 \rightarrow \cos \alpha = \sqrt{1 - \sin^2 \alpha} = -\sqrt{\frac{e^2}{\omega^2}} = -\frac{v}{\omega \sqrt{r}}$$

$$\cos\left(\pi/2 + \frac{3\pi}{2} + \alpha\right) = \cos\left(\frac{3\pi}{2} + \alpha\right) = \cos \alpha \cos \frac{3\pi}{2} - \sin \alpha \sin \frac{3\pi}{2}$$

$$\Rightarrow \left(-\frac{v}{\omega \sqrt{r}} \times \frac{\sqrt{r}}{r}\right) - \left(\frac{\sqrt{r}}{1} \times \frac{\sqrt{r}}{r}\right) = \frac{v}{10} - \frac{1}{10} = \frac{6}{10} = \frac{3}{5} \leftarrow \text{جواب}$$

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