

1- $S = ab \sin \alpha \Rightarrow ab = 101$ $P = 2 \times 9\sqrt{2} + 2 \times 4\sqrt{2} = 26\sqrt{2}$

$\frac{a}{b} = \frac{4}{9} \rightarrow a = \frac{4}{9}b$ $\Rightarrow \frac{4}{9}b^2 = 101 \rightarrow b = 9\sqrt{2}, a = 4\sqrt{2}$ 5

2- $S_{ABC} - S_{ADE} = 1/2 VA \Rightarrow \frac{1}{2} \times V \times (\underbrace{\cos \hat{A} - 4 \sin \hat{A}}_{\sin \hat{A}}) = 1/2 VA \rightarrow \sin \hat{A} = \frac{1}{5} \rightarrow \hat{A} = 30^\circ$

$\tan 30^\circ = \frac{\sin 30^\circ}{\cos 30^\circ} = \frac{1/5}{\frac{\sqrt{3}}{5}} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$ 5

3- $\frac{|\sin \alpha|}{\cos \alpha} = -\frac{\sin \alpha}{\cos \alpha} \Rightarrow \cos \alpha \sin \alpha < 0$ $\Rightarrow \begin{cases} \sin \alpha > 0 \\ \cos \alpha < 0 \end{cases} \rightarrow$ ربع دوم

$\frac{\sqrt{\frac{1}{\cos^2 \alpha}}}{|\frac{1}{\cos \alpha}|} - \frac{\sin \alpha}{\cos \alpha} = \frac{1 + \sin \alpha}{|\cos \alpha|} \Rightarrow \frac{1}{|\cos \alpha|} - \frac{1 + \sin \alpha}{|\cos \alpha|} = \frac{\sin \alpha}{\cos \alpha} \Rightarrow \frac{\sin \alpha}{|\cos \alpha|} = \frac{\sin \alpha}{-\cos \alpha}$ 5

\downarrow
 $\cos \alpha < 0$

4- $\cot(\underbrace{90^\circ - \alpha}_{\alpha'}) = \frac{1}{\tan \alpha} = \frac{1}{\frac{1}{\sqrt{3}}} = \sqrt{3} \Rightarrow \tan(\frac{\pi}{2} - \alpha) = \cot \alpha = \frac{1}{\tan \alpha} = \sqrt{3}$ 5

5- $\frac{2 \cos(41^\circ + 11^\circ) - 2 \sin(41^\circ + 9^\circ)}{\sin(180^\circ - 41^\circ) - \cos(180^\circ - 41^\circ)} = \frac{-2 \cos(52^\circ) - 2 \cos(50^\circ)}{-\cos(41^\circ) - \cos(41^\circ)} = \frac{2}{\sqrt{2}}$ 5

6- $\cos \alpha = \frac{1}{\sqrt{2}} \rightarrow \sin \alpha = -\sqrt{1 - \frac{1}{2}} = -\frac{\sqrt{2}}{2}$ $\Rightarrow \tan \alpha = -\frac{\sqrt{2}}{1}$

$\frac{\cos \alpha + \sin \alpha}{|\tan \alpha - 1|} = \frac{\frac{1}{\sqrt{2}} + \frac{\sqrt{2}}{2}}{|\frac{1}{\sqrt{2}} - 1|} = \frac{1(\frac{1}{\sqrt{2}} + \frac{\sqrt{2}}{2})}{\sqrt{2} - 1}$ 10

7- $\frac{\sin^2 \alpha + \cos^2 \alpha}{\cos^2 \alpha} = 1 \rightarrow \frac{1}{\cos^2 \alpha} = 1 \rightarrow \cos \alpha = \pm \frac{1}{\sqrt{2}} = \pm \frac{\sqrt{2}}{2}$ 5

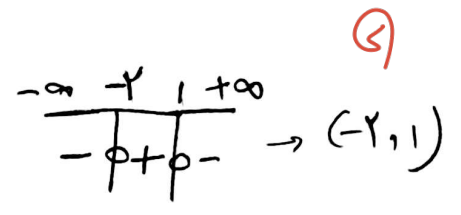
8- $\frac{1}{\sqrt{3}} = \tan 30^\circ = \sqrt{3} \Rightarrow \frac{-2m}{m^2 - 1} = \sqrt{3} \rightarrow \sqrt{3}m^2 + 2m - \sqrt{3} = 0$ 5

$m^2 + 2m - \sqrt{3} = 0 \rightarrow m = \frac{-2 \pm \sqrt{4 + 4\sqrt{3}}}{2} = \frac{-2 \pm 2\sqrt{1 + \sqrt{3}}}{2} = -1 \pm \sqrt{1 + \sqrt{3}}$

اقلت مقار $= \frac{\sqrt{3}}{3} = (-\sqrt{3}) = \frac{1}{\sqrt{3}}$

$$\begin{aligned} -\frac{\pi}{r} < \alpha < \frac{\pi}{r} \\ -\frac{\pi}{r} < -\alpha < \frac{\pi}{r} \end{aligned} \left. \begin{array}{l} \downarrow -1 \\ \downarrow +\frac{\pi}{r} \end{array} \right\}$$

$$0 < \frac{\pi}{r} - \alpha < \frac{\pi}{r} \Rightarrow \tan\left(\frac{\pi}{r} - \alpha\right) > 0 \Rightarrow \frac{1-m}{r+m} > 0$$



$$\frac{\tan(45^\circ)}{-\sqrt{r}} \times \frac{\cos(45^\circ)}{-\frac{\sqrt{r}}{r}} + \frac{\tan(45^\circ)}{-\sqrt{r}} \times \frac{\sin(45^\circ)}{\frac{\sqrt{r}}{r}} = \frac{r}{r} - \frac{r}{r} = 0 \quad (5)$$