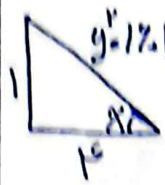


الف) $\tan 135^\circ + \sin 135^\circ + \cos 225^\circ = -1 - \frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2} = -1 - \sqrt{2}$

ب) $\tan 135^\circ + \sin 135^\circ + \cos 135^\circ = -\frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2} - \frac{1}{2} = \frac{-\sqrt{2} - \sqrt{2} - 1}{2} = \frac{-2\sqrt{2} - 1}{2}$



$y = 1 \cdot 1 = 1 \rightarrow y = \sqrt{2}$
 $\cos \alpha = \frac{1}{\sqrt{2}}$
 $\sin \alpha = \frac{1}{\sqrt{2}}$

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

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

الف) $\cos \alpha \rightarrow \cos^2 \alpha = 1 - \sin^2 \alpha \Rightarrow 1 - \frac{9}{100} = \frac{91}{100} \rightarrow \cos \alpha = -\frac{\sqrt{91}}{10}$

$\cos(135^\circ + \alpha) = \cos 135^\circ \cos \alpha - \sin 135^\circ \sin \alpha = -\frac{\sqrt{2}}{2} \times -\frac{\sqrt{91}}{10} - \left(\frac{\sqrt{2}}{2} \times \frac{3}{10} \right) = \frac{\sqrt{182}}{20} - \frac{3\sqrt{2}}{20} = \frac{\sqrt{182} - 3\sqrt{2}}{20}$

ب)



$\sin \alpha = \frac{1}{\sqrt{5}}$
 $\cos \alpha = \frac{\sqrt{2}}{\sqrt{5}}$

$\sin(135^\circ + \alpha) = \sin 135^\circ \cos \alpha + \sin \alpha \cos 135^\circ$
 $= \frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{\sqrt{5}} + \frac{1}{\sqrt{5}} \times -\frac{1}{2} = \frac{2}{2\sqrt{5}} - \frac{1}{2\sqrt{5}} = \frac{1}{2\sqrt{5}} = \frac{\sqrt{5}}{10}$

$9 \sin^2 \alpha + \cos^2 \alpha = \frac{1}{9}$

$9 \sin^2 \alpha + \cos^2 \alpha = 1$

$\sin^2 \alpha = \frac{1}{9}$

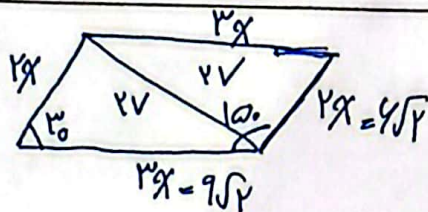
$\cos^2 \alpha = \frac{8}{9}$

$\tan^2 \alpha = \frac{\sin^2 \alpha}{\cos^2 \alpha} = \frac{1}{8} \Rightarrow \tan \alpha = \frac{1}{2\sqrt{2}}$

$$S_{\text{triangle}} = \frac{1}{2} ab \sin \alpha \rightarrow \frac{1}{2} \times 4 \times \sqrt{3} \times \sin \alpha = \frac{9}{2} \rightarrow \sin \alpha = \frac{9}{4 \times \sqrt{3}} = \frac{\sqrt{3}}{4} \rightarrow \alpha = 15^\circ$$

$$15^\circ - 5^\circ = 10^\circ$$

6



$$9 \times \sqrt{3} = \frac{1}{2} \times \frac{1}{2} \times 4 \times 4 \times \sin \alpha \rightarrow \sin \alpha = \frac{9}{4} \rightarrow \alpha = 15^\circ$$

$$P = 4(4\sqrt{3} + 4\sqrt{3}) = 32\sqrt{3}$$

7

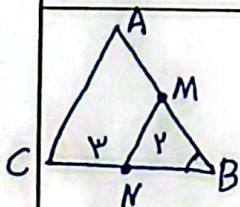
$$S_{ABC} = \frac{1}{2} \times 4 \times 4 \times \sin A = 16 \sin A$$

$$S_{ADE} = \frac{1}{2} \times 4 \times 4 \times \sin A = 16 \sin A$$

$$16 \sin A = 16 \sin A \rightarrow \sin A = \frac{1}{2} \rightarrow A = 30^\circ$$

$$\tan 30^\circ = \frac{\sqrt{3}}{3}$$

8



$$\frac{S_{ABC}}{S_{BMN}} = \frac{\frac{1}{2} \times \sin B \times AB \times BC}{\frac{1}{2} \times \sin B \times BM \times BN} = 4 \rightarrow \omega(AB=AM+MB) = 4BM$$

$$\omega AM + \omega MB = 4BM \rightarrow \omega AM = 3BM$$

$$\frac{BM}{AM} = \frac{1}{3}$$

9

$$\frac{1}{|\cos \alpha|} - \frac{\sin \alpha}{\cos \alpha} = \frac{1 + \sin \alpha}{|\cos \alpha|}$$

$$\frac{1 + \sin \alpha}{\cos \alpha} \rightarrow \frac{1 - \sin \alpha}{\cos \alpha}$$

$$\frac{-1 - \sin \alpha}{\cos \alpha} = \frac{-1 - \sin \alpha}{\cos \alpha} \rightarrow \cos \alpha > 0 \rightarrow \text{ناقص ۲ و ۳}$$

$$\frac{|\sin \alpha|}{\cos \alpha} = \frac{-\sin \alpha}{\cos \alpha} \rightarrow \sin \alpha < 0 \rightarrow \text{ناقص ۲ و ۳}$$

افزودن منفی به منفی
sin α منفی بوده است

ناقص ۲ است

10