

۱۹، ۵

امین خالقی (هم الف)

همه شان یک دور کامل بگذرد و اندازه آن $\Rightarrow \tan(\pi + \frac{\pi}{4}) + \sin(\pi + \frac{\pi}{4}) \times \cos(\pi + \frac{\pi}{4}) \Rightarrow \tan(\frac{\pi}{4}) + \sin(\frac{\pi}{4}) \times \cos(\frac{\pi}{4}) \Rightarrow -1 + (-\frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{2}) = -1 - \frac{1}{2} = -\frac{3}{2}$ (سوال ۱)

$\tan(\frac{\pi}{4}) + \sin(\frac{\pi}{4}) \times \cos(\frac{\pi}{4}) \Rightarrow -1 + (-\frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{2}) = -1 - \frac{1}{2} = -\frac{3}{2}$ (۵)

ب) $\tan(\pi + \frac{\pi}{4}) \times \sin(\pi + \frac{\pi}{4}) + \cos(\pi + \frac{\pi}{4})$

$\tan(\frac{\pi}{4}) \times \sin(\frac{\pi}{4}) + \cos(\frac{\pi}{4}) \Rightarrow -\frac{\sqrt{2}}{2} \times -\frac{\sqrt{2}}{2} + (-\frac{1}{2}) = \frac{1}{2} - \frac{1}{2} = 0$ (نصف دوم $\tan < 0$)

$\frac{\cos d}{\sin d} = f \Rightarrow f \sin d = \cos d \quad \frac{f \cos d - \sin d}{\cos d + \sin d} = \frac{11 \sin d - \sin d}{8 \sin d} = \frac{10 \sin d}{8 \sin d} \Rightarrow \frac{5}{4}$ (سوال ۲)

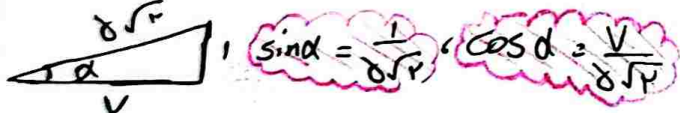
$\sin^2 d + \cos^2 d = 1 \Rightarrow f \cos^2 d + \cos^2 d = 1 \rightarrow \cos^2 d = \frac{1}{8} \rightarrow \cos d = \pm \frac{1}{\sqrt{8}}$
 $\sin d = f \cos d \rightarrow \sin^2 d = \frac{f^2}{8} \rightarrow \sin d = \pm \frac{f}{\sqrt{8}}$ (۳ سوال ۲)

$\cos d = -\frac{1}{\sqrt{8}}$ (از آنجایی که امکان دارد ناحیه سوم است پس هم $\sin d$ و هم $\cos d$ عدد منفی اند نه نتیجه)

$\sin^2 d + \cos^2 d = 1 \Rightarrow \frac{f^2}{8} + \cos^2 d = 1 \Rightarrow \cos^2 d = \frac{4-f^2}{8} \Rightarrow \cos d = \pm \frac{\sqrt{4-f^2}}{\sqrt{8}}$ (سوال ۴)

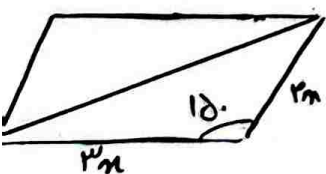
$\cos(\frac{\pi}{4} + d) \Rightarrow \cos \frac{\pi}{4} \times \cos d - \sin \frac{\pi}{4} \times \sin d \Rightarrow (-\frac{\sqrt{2}}{2} \times \frac{\sqrt{4-f^2}}{\sqrt{8}}) - (\frac{\sqrt{2}}{2} \times \frac{f}{\sqrt{8}}) = -\frac{\sqrt{2}}{2} \times \frac{\sqrt{4-f^2} + f}{\sqrt{8}} = -\frac{\sqrt{4-f^2} + f}{2\sqrt{4}}$

$\sin(\frac{\pi}{4} + d) = (\sin d \cdot \cos \frac{\pi}{4}) + (\cos d \cdot \sin \frac{\pi}{4}) \Rightarrow (\frac{f}{\sqrt{8}} \times \frac{\sqrt{2}}{2}) + (-\frac{\sqrt{4-f^2}}{\sqrt{8}} \times \frac{\sqrt{2}}{2}) = \frac{f - \sqrt{4-f^2}}{2\sqrt{4}}$



$f \sin^2 \alpha + \cos^2 \alpha = \frac{f}{\mu}$
 $-\sin^2 \alpha - \cos^2 \alpha = -1$
 $\sin^2 \alpha = \frac{1}{\mu}, \cos^2 \alpha = \frac{1}{\mu}$
 $\tan^2 \alpha = \frac{\sin^2 \alpha}{\cos^2 \alpha} = \frac{1}{\mu} \Rightarrow \tan \alpha = \frac{1}{\sqrt{\mu}}$ (سوال ۵)

$\frac{1}{f} \sin \alpha b a = f d \Rightarrow \sin \alpha \cdot 4\sqrt{3} = 4 \Rightarrow \sin \alpha = \frac{4}{4\sqrt{3}} = \frac{1}{\sqrt{3}} \Rightarrow \sqrt{\frac{1}{3}}$
 $\sin 40^\circ \approx \sqrt{\frac{1}{3}} \quad \sin 12^\circ \approx \sqrt{\frac{1}{3}} \Rightarrow \frac{12}{40} \approx \frac{1}{3}$ (سوال ۶)



$\frac{1}{2} \sin 120^\circ \times 10 \times 12 = 30$
 $4\pi^2 = 16\pi \Rightarrow \pi^2 = 4\pi \Rightarrow \pi = 4\sqrt{2}$

$P = 10 \times 12 = 120\sqrt{2}$

(سوال ۷)

سؤال ١ (٢)

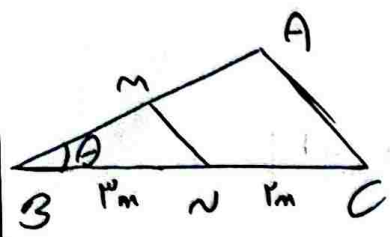
$$|S_{ADE} - S_{ABC}| = 1/4 \delta$$

$$\left| \frac{1}{p} \sin A (\delta x^2 - \delta x v) \right| \Rightarrow \frac{1}{p} \sin A = \frac{1}{4} \Rightarrow \sin A = \frac{1}{4} \Rightarrow A = 3.0^\circ$$

$$\tan 3.0^\circ = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$$

دقت! این ۳ همیشه!

سؤال ٢



$$\frac{S_{ABC}}{S_{BMN}} = \frac{\frac{1}{2} \sin \theta (AB \times BC)}{\frac{1}{2} \sin \theta (BM \times BN)} = \frac{(AM + BM) \times \delta m}{(BM) \times (m)} \Rightarrow \frac{AM + BM}{BM} = \frac{4}{\delta}$$

$$4BM = \delta BM + \delta AM \Rightarrow 3BM = \delta AM \Rightarrow \frac{BM}{AM} = \frac{\delta}{3} = 1/3$$

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

$$- \frac{\sin \alpha}{\cos \alpha} = \frac{\sin \alpha}{|\cos \alpha|} \Rightarrow \cos \alpha < 0$$

$$\frac{|\sin \alpha|}{\cos \alpha} = - \frac{\sin \alpha}{\cos \alpha} \Rightarrow \sin \alpha < 0$$

نقطه چهارم

(٢)