آیلا جعفری تکلیف ۱۸ ام ریاضی دهم A

$\tan\frac{3\pi}{4} + \sin\frac{7\pi}{4}\ \cos\frac{5\pi}{4} = -1 + (-\frac{\sqrt{2}}{2})^2 = \frac{-1}{2}$ — ۱۴٫۲۵ — ۰٫۲۵

۱- الف) $\to \tan(\frac{8\pi}{4}+\frac{3\pi}{4}) + \sin(\frac{8\pi}{4}+\frac{7\pi}{4}) \times \cos(\frac{8\pi}{4}+\frac{5\pi}{4}) = \tan\frac{3\pi}{4} + \sin\frac{7\pi}{4} + \cos\frac{5\pi}{4} = 1-2\sqrt{2}-2\sqrt{2} = 1-4\sqrt{2}$

ب) $\to \underbrace{\tan(\frac{12\pi}{6}+\frac{5\pi}{6})}_{\tan\frac{5\pi}{6}} \times \underbrace{\sin(\frac{6\pi}{3}+\frac{5\pi}{3})}_{\sin\frac{5\pi}{3}} + \underbrace{\cos(\frac{6\pi}{3}+\frac{4\pi}{3})}_{\cos\frac{4\pi}{3}} = (\frac{-1}{\sqrt{3}}) \times (\frac{-\sqrt{3}}{2}) + (-\frac{1}{2}) = \frac{1}{2} - \frac{1}{2} = 0$ — ۱ — ۱٫۲۵

۲- $\to \frac{\cos x}{\sin x} = 4 \to \cos x = 4\sin x \to \frac{3\cos x - \sin x}{\cos x + \sin x} = \frac{12\sin x - \sin x}{4\sin x + \sin x} = \frac{11\sin x}{5\sin x} = \frac{11}{5} = 2.2$ — ۲

۳- $\sin\alpha = 2\cos\alpha \to \tan\alpha = \frac{\sin\alpha}{\cos\alpha} = \frac{2\cos\alpha}{\cos\alpha} = 2 \to 1+\tan^2\alpha = \frac{1}{\cos^2\alpha} \to 1+2^2 = 5 = \frac{1}{\cos^2\alpha} \to \cos\alpha = \pm\frac{\sqrt{5}}{5} \to -\frac{\sqrt{5}}{5}$ (ثلث) — ۲

۴- الف) $\cos(\frac{11\pi}{4}+\alpha) = (\cos\frac{11\pi}{4} \times \cos\alpha) - (\sin\frac{11\pi}{4} \times \sin\alpha) = ((-\frac{\sqrt{2}}{2})\times(\frac{-7\sqrt{2}}{10})) - ((\frac{\sqrt{2}}{2}\times\frac{\sqrt{2}}{10})) = \frac{14}{20} - \frac{2}{20} = \frac{12}{20} = 0.6$ — ۲

$\cos\frac{3\pi}{4}$ ، $\sin\frac{3\pi}{4} = \frac{\sqrt{2}}{2}$

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

$\sin^2\alpha = 1 - \frac{2}{100} = \frac{98}{100} \to \sin\alpha = \frac{-7\sqrt{2}}{10}$

ب) $\sin(\frac{13\pi}{4}+\alpha) = (\sin\frac{13\pi}{4} \times \cos\alpha) + (\cos\frac{13\pi}{4} \times \sin\alpha) = ((-\frac{\sqrt{2}}{2}) \times \frac{7}{5\sqrt{2}}) + ((-\frac{\sqrt{2}}{2}) \times (\frac{1}{5\sqrt{2}})) = \frac{-7\sqrt{2}}{10\sqrt{2}} - \frac{\sqrt{2}}{10\sqrt{2}} = \frac{-8\sqrt{2}}{10\sqrt{2}} = \frac{-8}{10} = -0.8$

$\sin\frac{5\pi}{4}$ ، $\cos\frac{5\pi}{4}$

$1+\tan^2\alpha = \frac{1}{\cos^2\alpha} \to 1+\frac{1}{49} = \frac{50}{49} = \frac{1}{\cos^2\alpha} \to \cos\alpha = \frac{7}{5\sqrt{2}}$

$\sin^2\alpha + \cos^2\alpha = 1 \to \frac{49}{50} + \sin^2\alpha = 1 \to \sin\alpha = \frac{1}{5\sqrt{2}}$

۵- $2\sin^2 x + \cos^2 x = \frac{4}{3} \to \sin^2 x + \sin^2 x + \cos^2 x = \frac{4}{3} \to \sin^2 x = \frac{1}{3} \to \cos^2 x = \frac{2}{3} \to \frac{\sin^2 x}{\cos^2 x} = \tan^2 x = \frac{\frac{1}{3}}{\frac{2}{3}} = \frac{1}{2}$ — ۲

۶- $S = \frac{1}{2}ab\sin\alpha = \frac{1}{2}\times 6\times\sqrt{3}\times\sin\alpha = 4.5 \to \sin\alpha = \frac{\frac{9}{2}}{\frac{3\sqrt{3}}{1}} = \frac{9}{6\sqrt{3}} = \frac{3}{2\sqrt{3}} = \frac{\sqrt{3}}{2}$

بیشترین مقدار $\alpha = 120°$ ؛ کمترین مقدار $\alpha = 60°$ $\to \frac{120}{60} = 2$ — ۲

۷- $S = ab\sin\alpha = 2x\times 3x\times\sin 150° = 6x^2\times\frac{1}{2} = 3x^2 = 54 \to x^2 = 18 \to x = 3\sqrt{2} \to$ اضلاع متوازی الاضلاع $= 6\sqrt{2}, 9\sqrt{2}$

محیط $= 12\sqrt{2} + 18\sqrt{2} = 30\sqrt{2}$ — ۲

۸- $S_1 = S_{ABC} = \frac{1}{2}\times AB\times AC\times\sin A = \frac{1}{2}\times 5\times 7\times\sin A = \frac{35}{2}\sin A$ — ۲

$S_2 = S_{ADE} = \frac{1}{2}\times AD\times AE\times\sin\hat{A} = \frac{1}{2}\times 7\times 4\times\sin A = \frac{28}{2}\sin A$

$\to S_1 - S_2 = 1.75 \to \frac{7}{2}\sin A = \frac{7}{4} \to \sin A = \frac{1}{2} \xrightarrow{\text{A حاده است}} A = \frac{\pi}{6} \to \tan\hat{A} = \frac{\sqrt{3}}{3}$

۹- $\frac{S_{ABC}}{S_{BMN}} = \frac{\frac{1}{2}\times AB\times BC\times\sin\hat{B}}{\frac{1}{2}\times BM\times BN\times\sin\hat{B}} = \frac{AB\times BC}{BM\times BN} = \frac{(BM+AM)\times(BN+CN)}{BM\times BN} = 3 \to (BM+AM)\times\overbrace{(BN+\underbrace{CN}_{\frac{2}{3}BN})}^{\frac{5}{3}BN} = 3BM\times 3BN$ — ۲

$\Rightarrow \frac{5}{3}(BM+AM) = 9BM \to \frac{5}{3}BM + \frac{5}{3}AM = 9BM \to \frac{5}{3}AM = 9BM - \frac{5}{3}BM = \frac{22}{3}BM \to \frac{BM}{AM} = \frac{5}{22}$

۱۰- $\to \frac{|\sin x|}{\cos x} = \frac{-\sin x}{\cos x} \Rightarrow \sin x < 0$ و $\frac{1}{|\cos\alpha|} - \tan\alpha = \frac{1+\sin\alpha}{|\cos\alpha|} \to \frac{1}{|\cos\alpha|} - \frac{1+\sin\alpha}{|\cos\alpha|} = \tan\alpha \to \frac{-\sin\alpha}{|\cos\alpha|} = \frac{\sin\alpha}{\cos\alpha} \to \cos\alpha < 0 \to$ ناحیه سوم — ۲