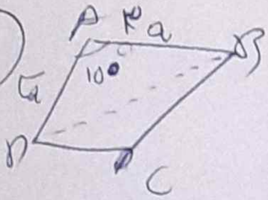
امیر حسین ... یازدهم ریاضی B

۲۰

۱) 

$S_{ABCD} = 2S_{ABD} = 2 \times \frac{1}{2} \times AD \times AB \times \sin\hat{A}$ (۲)

$= 2 \times \frac{1}{2} \times 2a \times 3a \times \frac{1}{2} = 3a^2 = 54 \to a = 3\sqrt{2}$

محیط متوازی الاضلاع $= 2(AB + AD) = 2 \times 5a = 10a = 30\sqrt{2}$

۲) $S_{A\hat{B}C} = \frac{1}{2} AC \times AB \times \sin\hat{A} = \frac{1}{2} \times 5 \times 7 \times \sin\hat{A} = \frac{35}{2}\sin\hat{A}$ (۲)

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

$\to S_{ABC} - S_{ADE} = \frac{7}{2}\sin A = 1/75 \to \sin A = \frac{1}{2} \to A = 30^\circ$ ق ق ، $A = 150^\circ$ غ ق

$\to \tan A = \tan 30 = \frac{\sqrt{3}}{3}$

۳) $\frac{1}{\sqrt{\cos^2\alpha}} - \tan\alpha = \frac{1}{|\cos\alpha|} - \frac{\sin\alpha}{\cos\alpha} = \frac{1+\sin\alpha}{|\cos\alpha|} = \frac{1}{|\cos\alpha|} + \frac{\sin\alpha}{|\cos\alpha|}$ (۲)

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

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

$\to$ α در ناحیه ۳

۴) $\tan B = \frac{1/5}{2} = \frac{3}{4}$ ، $B = 180 - \alpha$ $\to \tan(180-\alpha) = \frac{3}{4} \to \tan\alpha = -\frac{3}{4}$ (۲)

$\to \tan(\frac{3\pi}{2} - \alpha) = \cot\alpha = \frac{1}{\tan\alpha} = -\frac{4}{3}$

۵) $\frac{3\cos(270-22) - 2\sin(180-22)}{\sin(180+22) - \cos(270+22)} = \frac{3\cos(\frac{3\pi}{2} - 22) - 2\sin 22}{-\sin 22 - \sin 22} = \frac{-3\sin 22 - 2\sin 22}{-\sin 22 - \sin 22} = \frac{5}{2}$ (۲)

۶) $\frac{\sin(\frac{\pi}{2}+\alpha) - \sin(\alpha - \pi)}{|\tan^2\alpha - 1|} = \frac{\cos\alpha + \sin\alpha}{|\tan^2\alpha - 1|} = \frac{\frac{2}{3} - \frac{\sqrt{5}}{3}}{\frac{1}{4}} = \frac{8 - 4\sqrt{5}}{3}$ (۲)

$\cos\alpha = \frac{2}{3} \to \sin^2\alpha = 1 - \frac{4}{9} = \frac{5}{9} \to \sin\alpha = \pm\frac{\sqrt{5}}{3} \to \tan\alpha = -\frac{\sqrt{5}}{2}$

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

(۸) $2mx + (m^2-1)y = 3 \rightarrow y = \frac{-2m}{m^2-1}x + \frac{3}{m^2-1}$ (۲)

$\tan 60 = \sqrt{3} = \frac{-2m}{m^2-1} \rightarrow \sqrt{3}m^2 + 2m - \sqrt{3} = 0 \rightarrow$ اختلاف مقادیر m $= \frac{\sqrt{\Delta}}{|a|} = \frac{4}{\sqrt{3}} = \frac{4\sqrt{3}}{3}$ ✓

(۹) $\tan(\frac{\pi}{4} - x) = \frac{\tan\frac{\pi}{4} - \tan x}{1 + \tan\frac{\pi}{4} \times \tan x} = \frac{1 - \tan x}{1 + \tan x} = \frac{1-m}{3+m}$ (۲)

$\rightarrow \frac{1 - \tan x + 1 + \tan x}{1 + \tan x} = \frac{1 - m + 3 + m}{3+m} \rightarrow \frac{1 + \tan x}{2} = \frac{3+m}{4}$

$\rightarrow \tan x = \frac{2m+1}{3}$

$-\frac{\pi}{4} < x < \frac{\pi}{4}$

$\rightarrow -1 < \frac{2m+1}{3} < 1 \rightarrow -3 < 2m+1 < 3$

$\rightarrow -2 < m < 1$ ✓

(۱۰) $\tan(300)\cos(210) + \tan(480)\sin(120) = (-\sqrt{3})(-\frac{\sqrt{3}}{2}) + (-\sqrt{3})(\frac{\sqrt{3}}{2})$ (۲)

$\tan(120)\sin(120)$

$= \frac{3}{2} - \frac{3}{2} = 0$ ✓