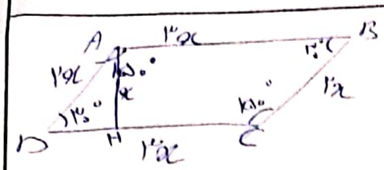
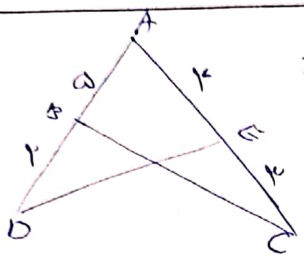
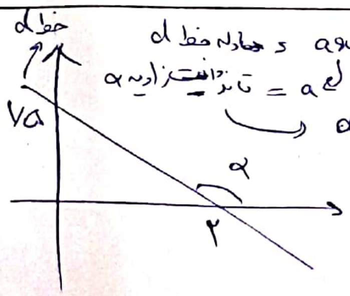
نام و نام خانوادگی ......دنیا بیابانی رضیری...... پاسخنامه تشریحی تکلیف شماره ...۲۶... کلاس ...یازدهم ریاضی...

۱	 $\hat B = 30^\circ$ از A به DC عمودی را رسم می‌کنیم AH در مثلث ADH: $\frac{AH}{AD} = \sin 30^\circ \Rightarrow \frac{1}{2} = \frac{AH}{2x} \to AH = x$ مساحت $= x \times 3x = 54 \to x^2 = 18 \to x = 3\sqrt{2}$ محیط $= 3x + 3x + 2x + 2x = 10x = 30\sqrt{2}$
۲	 $\underbrace{\frac{1}{2} \times \sin\hat A \times 5 \times 7}_{\text{مساحت } ABC} - \underbrace{\frac{1}{2} \times \sin\hat A \times 7 \times 4}_{\text{مساحت } ABE} = 1/75$ $\frac{7\sin\hat A}{2} = \frac{1/75}{2} \to \sin\hat A = \frac{1}{2} \to \hat A = 30^\circ \to \tan\hat A = \frac{\sqrt{3}}{3}$
۳	$\frac{1}{\sqrt{\cos^2\alpha}} - \tan\alpha = \frac{1+\sin\alpha}{\lvert\cos\alpha\rvert} \to \frac{1}{\lvert\cos\alpha\rvert} - \frac{\sin\alpha}{\cos\alpha} = \frac{1+\sin\alpha}{\lvert\cos\alpha\rvert} \to \frac{-\sin\alpha}{\lvert\cos\alpha\rvert} = \frac{\sin\alpha}{\cos\alpha}$ $\cos\alpha = -\lvert\cos\alpha\rvert$ ← cos منفی $\frac{\lvert\sin\alpha\rvert}{\cos\alpha} = \frac{-1}{\cot\alpha}$ $\frac{\lvert\sin\alpha\rvert}{\cos\alpha} = \frac{-\sin\alpha}{\cos\alpha} \to -\lvert\sin\alpha\rvert = \sin\alpha$ ← sin منفی → α در ناحیه سوم
۴	 معادله خط d $= ax + b = ax + \frac{3}{2} \xrightarrow{(2,0)} 2a + \frac{3}{2} = 0 \to 2a = -\frac{3}{2} \to a = -\frac{3}{4}$ تانژانت زاویه α $= a$ $a = -\frac{3}{4} \Rightarrow \tan\alpha = -\frac{3}{4} \to \cot\alpha = -\frac{4}{3}$ $\tan(\frac{\pi}{2} - \alpha) = \cot\alpha = -\frac{4}{3}$
	$\frac{3\cos(248^\circ) - 2\sin(158^\circ)}{\sin(202^\circ) - \cos(292^\circ)} = \frac{3\cos(\frac{3\pi}{2} - 22^\circ) - 2\sin(\pi - 22^\circ)}{2\sin(\pi + 22^\circ) - \cos(\frac{3\pi}{2} + 22^\circ)}$ $= \frac{-3\sin 22^\circ + 2\sin 22^\circ}{-2\sin 22 - \sin 22^\circ} = \frac{-\sin 22^\circ}{-3\sin 22^\circ} = \frac{1}{3}$

$\cos\alpha = \frac{\sqrt{3}}{4} \rightarrow \sin^2\alpha + \cos^2\alpha = 1 \rightarrow \sin^2\alpha + \frac{3}{16} = 1 \rightarrow \sin^2\alpha = \frac{13}{16} \rightarrow \sin\alpha = \frac{\sqrt{13}}{4}$

$\tan\alpha = \frac{\sin\alpha}{\cos\alpha} = \frac{\frac{\sqrt{13}}{4}}{\frac{\sqrt{3}}{4}} = \frac{\sqrt{13}}{\sqrt{3}}$

$\frac{\sin\left(\frac{\pi}{2}+\alpha\right) - \sin(\alpha-\pi)}{|\tan^2\alpha - 1|} = \frac{\cos\alpha + \sin\alpha}{|\tan^2\alpha - 1|} = \frac{\frac{\sqrt{3}}{4} - \frac{\sqrt{13}}{4}}{\left|\frac{13}{3} - 1\right|} = \frac{\frac{4-\sqrt{13}}{4}}{\frac{10}{3}} = \frac{4-\sqrt{13}}{12}$

$\sin(\alpha-\pi) = \sin(\pi-\alpha)$

۶

$\sin\alpha = 2\cos\alpha$

$\sin^2\alpha + \cos^2\alpha = 1 \rightarrow 4\cos^2\alpha + \cos^2\alpha = 1 \rightarrow \cos^2\alpha = \frac{1}{5} \rightarrow \cos\alpha = -\frac{1}{\sqrt{5}}$

$\sin\alpha = -\frac{2}{\sqrt{5}}$

۷

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

45° میل $\rightarrow \frac{-2m}{(m^2-1)} = \sqrt{3} \rightarrow \sqrt{3}m^2 - \sqrt{3} = -2m \rightarrow \sqrt{3}m^2 + 2m - \sqrt{3} = 0$

$\Delta = 4 - 4(-\sqrt{3})(\sqrt{3}) = 4 + 12 = 16$ $\cos\omega \rightarrow m = \frac{-2 \pm \sqrt{16}}{2\sqrt{3}}$ $\rightarrow \frac{-2+4}{2\sqrt{3}} = \frac{1}{\sqrt{3}}$ $\frac{-2-4}{2\sqrt{3}} = \frac{-6}{2\sqrt{3}} = \frac{-3}{\sqrt{3}}$

اختلاف $= \frac{1}{\sqrt{3}} - \left(\frac{-3}{\sqrt{3}}\right) = \frac{4}{\sqrt{3}} = \frac{4\sqrt{3}}{3}$

۸

$\tan\left(\frac{\pi}{4} - x\right) = \frac{1-m}{2+m}$

$-\frac{\pi}{4} < x < \frac{\pi}{4} \rightarrow -\frac{\pi}{12} < -x < \frac{\pi}{4} \rightarrow \frac{\pi}{4} - \frac{\pi}{12} < \frac{\pi}{4} - x < \frac{\pi}{4} + \frac{\pi}{12} \rightarrow 0 < \frac{\pi}{4} - x < \frac{\pi}{12}$

$0 < \tan\left(\frac{\pi}{4} - x\right) < \sqrt{3} \rightsquigarrow 0 < \frac{1-m}{2+m} < \sqrt{3}$ $\wedge$

$-2 < m < 1$ $\quad$ $\frac{1-m-\sqrt{3}}{2+m} < 0$ $\rightarrow -2 < m < 1-\sqrt{3}$

$-2 < m < 1$ $\rightarrow -2 \leq m \leq 1-\sqrt{3}$

۹

$\tan(300^\circ)\cos(210^\circ) + \tan(480^\circ)\sin(840^\circ)$

$= \tan\left(\frac{4\pi}{3} - 60^\circ\right)\cos\left(\frac{5\pi}{3} - 60^\circ\right) + \tan\left(\frac{8\pi}{3} - 60^\circ\right)\sin(9\pi - 60^\circ)$

$= (-\tan 60^\circ) \times (-\sin 60^\circ) + (-\tan 60^\circ)(\sin 60^\circ) = \tan 60^\circ \sin 60^\circ - \tan 60^\circ \sin 60^\circ = 0$

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