(۱) $S = \frac{1}{2} \times 2x \times \sin 150^\circ = 4x^2 \times \frac{1}{2} = 2x^2 = 8 \Rightarrow x^2 = 4 \rightarrow x = 2\sqrt{2}$

$P = 2(3x + 2x) = 10x = 10(2\sqrt{2}) = 20\sqrt{2}$

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(۲) $S_{ABC} - S_{ADE} = \frac{1}{2}(AB)(AC)\sin A - \frac{1}{2}(AD)(AE)\sin A$

$= \frac{1}{2} \times 6 \times 5 \times \sin A - \frac{1}{2} \times 3 \times 4 \times \sin A \rightarrow \frac{5}{2}\sin A = \frac{5}{4} \rightarrow \sin A = \frac{1}{2} \rightarrow$

$\tan A = \frac{1}{\sqrt{3}}$

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

$\rightarrow -\cos \alpha = |\cos \alpha| \rightarrow \cos \alpha < 0$

$\frac{|\sin \alpha|}{\cos \alpha} = -\frac{1}{\cot \alpha} \rightarrow \frac{|\sin \alpha|}{\cos \alpha} = -\frac{\sin \alpha}{\cos \alpha} \rightarrow \sin \alpha < 0$ $\Rightarrow$ ناحیه سوم

ناحیه سوم

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(۴) $\begin{bmatrix} (2,0) \\ (0,1,5) \end{bmatrix} \rightarrow m = -\frac{3}{4} \rightarrow \tan \alpha = -\frac{3}{4} \rightarrow \cot \alpha = -\frac{4}{3}$

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

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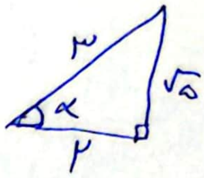
(۵) $\begin{bmatrix} 840^\circ = \frac{4\pi}{2} - 22^\circ \\ 158^\circ = \pi - 22^\circ \\ 202^\circ = \pi + 22^\circ \\ 292^\circ = \frac{4\pi}{2} + 22^\circ \end{bmatrix} \rightarrow \frac{-3\sin 22^\circ - 2\sin 22^\circ}{-\sin 22^\circ - \sin 22^\circ} = \frac{-5\sin 22^\circ}{-2\sin 22^\circ} = 2.5$

۶) $= \dfrac{\cos\alpha + \sin\alpha}{|\tan^{۲}\alpha - ۱|} = \dfrac{\frac{۲}{۳} - \frac{\sqrt{۵}}{۳}}{\left|\left(-\frac{\sqrt{۵}}{۲}\right)^{۲} - ۱\right|} = \dfrac{\frac{۲-\sqrt{۵}}{۳}}{\frac{۱}{۴}} = \dfrac{۴(۲-\sqrt{۵})}{۳}$



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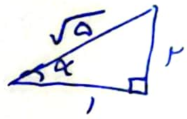
۷) $\sin\alpha = ۲\cos\alpha \longrightarrow \dfrac{\sin\alpha}{\cos\alpha} = ۲ \longrightarrow \tan\alpha = ۲ \longrightarrow \cos\alpha = -\dfrac{۱}{\sqrt{۵}} = -\dfrac{\sqrt{۵}}{۵}$



فاطمه طهوری

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۸) $m = \tan ۶۰ = \sqrt{۳}$

$۲mx + (m^{۲}-۱)y = ۳ \longrightarrow y = \dfrac{-۲mx}{m^{۲}-۱} + \dfrac{۳}{m^{۲}-۱}$

$-\dfrac{۲m}{m^{۲}-۱} = \sqrt{۳} \longrightarrow \sqrt{۳}m^{۲} - \sqrt{۳} = -۲m \longrightarrow \sqrt{۳}m^{۲} + ۲m - \sqrt{۳} = ۰$

$\hookrightarrow m^{۲} + ۲m - ۳ = ۰ \longrightarrow m_{۱} = \dfrac{-۳}{\sqrt{۳}} \quad m_{۲} = \dfrac{۱}{\sqrt{۳}}$

اختلاف $\longrightarrow \left|\dfrac{۱}{\sqrt{۳}} + \dfrac{۳}{\sqrt{۳}}\right| = \dfrac{۴\sqrt{۳}}{۳}$

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۹) $\xrightarrow{x \ominus} \dfrac{\pi}{۴} > -x > -\dfrac{\pi}{۴} \xrightarrow{+\frac{\pi}{۴}} \dfrac{\pi}{۲} > \dfrac{\pi}{۴} - x > ۰ \longrightarrow ۰ < \tan\left(\dfrac{\pi}{۴} - x\right) < \infty$

$۰ < \dfrac{۱-m}{۲+m} \longrightarrow$

	-۲		۱	
$-$		$+$		$-$

$\longrightarrow (-۲, ۱)$

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۱۰) $\tan(۳۰۰) = -\sqrt{۳}$

$\cos(۲۱۰) = -\dfrac{\sqrt{۳}}{۲}$

$\tan(۴۸۰) = -\sqrt{۳}$

$\sin(۸۴۰) = \dfrac{\sqrt{۳}}{۲}$

$\Longrightarrow \tan(۳۰۰)\cot(۲۱۰) + \tan(۴۸۰)\sin(۸۴۰) = ۰$