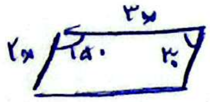
$S = ۶x^۲ \times \frac{۱}{۲} = ۵۴ \to x = ۳\sqrt{۲}$

$P = ۲ \times ۵x = ۳۰\sqrt{۲}$

به نام خداوند ...   ۱۷   یونا ...

①

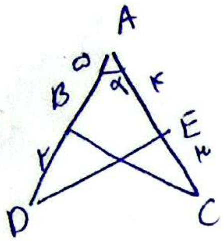


$\frac{۱}{۲} \times ۳x \times ۲x \times \sin ۳۰ = \frac{\cancel{۶}x^۲}{۴} = ۵۴ \Rightarrow$ ... $\Rightarrow$ ...

$x^۲ = ۳۶ \Rightarrow x = ۶$

$۱۰ \times ۶ = \boxed{۶۰}$ $\boxed{۱۲\sqrt{۳}}$

②



$S_{\overset{\triangle}{ABC}} - S_{\overset{\triangle}{ADE}} = \frac{۱}{۲} \times ۷ \times ۵ \times \sin\alpha - \frac{۱}{۲} \times ۷ \times ۴ \times \sin\alpha$

$= \frac{۱}{۲} \times ۷(۵-۴)\sin\alpha = ۱/۷۵ \Rightarrow$ $۳/۵ = ۷ \times \sin\alpha$

$\Rightarrow \sin\alpha = \frac{۳/۵}{۷} = \frac{۱}{۲}$ $\tan\alpha = \frac{\sin\alpha}{\cos\alpha} = \frac{\frac{۱}{۲}}{\frac{\sqrt{۳}}{۲}} = \frac{۱}{\sqrt{۳}} = \frac{\sqrt{۳}}{۳}$

$\sin^۲\alpha + \cos^۲\alpha = ۱ \Rightarrow \frac{۱}{۴} + \underbrace{\frac{۳}{۴}}_{\cos^۲\alpha} = ۱ \Rightarrow \cos\alpha = \frac{\sqrt{۳}}{۲}$ ناحیه اول

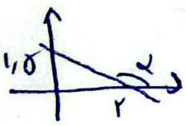
③

$\frac{۱}{\sqrt{\cos^۲\alpha}} - \tan\alpha = \frac{۱}{|\cos\alpha|} - \frac{\sin\alpha}{\cos\alpha} = \frac{۱+\sin\alpha}{|\cos\alpha|} \Rightarrow \boxed{\cos\alpha < ۰}$

$\frac{|\sin\alpha|}{\cos\alpha} = -\frac{\sin\alpha}{\cos\alpha} \Rightarrow \boxed{\sin\alpha < ۰}$ انتهای کمان در ناحیه سوم است

④

$\tan(\frac{\pi}{۲} - \alpha) = \cot\alpha = -\frac{۴}{۳}$



$\tan\alpha = \frac{\Delta y}{\Delta x} = \frac{-۱/۵}{۲} = -\frac{۳}{۴} \Rightarrow \boxed{\cot\alpha = -\frac{۴}{۳}}$

⑤

$\frac{۳\cos(۲۴۸) - ۲\sin(۱۵۸)}{\sin(۲۰۲) - \cos(۲۹۲)} = \frac{۳\cos(\overset{\frac{۳\pi}{۲}}{۲۷۰} - ۲۲) - ۲\sin(\pi - ۲۲)}{\sin(\pi + ۲۲) - \cos(\frac{۳\pi}{۲} + ۲۲)}$

$= \frac{-۳\sin ۲۲ - ۲\sin ۲۲}{-\sin ۲۲ - \sin ۲۲} = \frac{-۵\sin ۲۲}{-۲\sin ۲۲} = \frac{۵}{۲} = ۲/۵$

[illegible]

⑦

$\Rightarrow \sin^2\alpha = 4\cos^2\alpha$ ربع سوم α $\cos\alpha = ?$

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

$\underbrace{\sin^2\alpha}_{4\cos^2\alpha} + \cos^2\alpha = 1 \Rightarrow 5\cos^2\alpha = 1 \Rightarrow \cos^2\alpha = \frac{1}{5} \xRightarrow{\text{ربع سوم}} \cos\alpha = -\frac{1}{\sqrt{5}}$

$\Rightarrow -\frac{\sqrt{5}}{5} = \cos\alpha$

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⑧

$2mx + (m^2-1)y = 2 \Rightarrow \frac{-\text{ضریب } x}{\text{ضریب } y}$

$\tan\alpha \Rightarrow \tan 60 = m \Rightarrow \sqrt{3} = \frac{-2m}{m^2-1} = \frac{2m}{1-m^2} = \sqrt{3} \Rightarrow \sqrt{3} - \sqrt{3}m^2 = 2m$

$\Rightarrow \sqrt{3}m^2 + 2m - \sqrt{3} = 0$ $\quad \div\sqrt{3} \quad m^2 + 2m - 3 = 0$

$(m+3)(m-1) = 0 \quad \boxed{m = -3, 1}$

$m_2 - m_1 = 1 - (-3) = \boxed{4}$

$|x_1 - x_2| = \frac{\sqrt{\Delta}}{|a|} = \frac{\sqrt{16}}{\sqrt{3}} = \frac{4}{\sqrt{3}}$

1,25

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⑨

$\tan\Big(\underbrace{\frac{\pi}{4} - x}_{\alpha}\Big) = 6 \qquad 0 < \tan\alpha < +\infty$

زاویه داخل [illegible]

0 تا $\frac{\pi}{2}$ $\Rightarrow 0 < \frac{1-m}{2+m}$

	-2		1	
$-$		$+$		$-$

$\boxed{-2 < m < 1} \Rightarrow m \in (-2, 1)$

1,75

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⑩

$\tan(300^\circ)\cos(210^\circ) + \tan(\underbrace{480}_{120})\sin(\overset{720}{\underbrace{840}_{120}})$

$-\sqrt{3} \times -\frac{\sqrt{3}}{2} + -\sqrt{3} \times \frac{\sqrt{3}}{2}$

$= +\frac{3}{2} - \frac{3}{2} = 0$

بنام خداوند

$\cos\alpha = \frac{2}{3}$ ناحیه چهارم $\sin\alpha < 0$

۲

$$\cos^2\alpha + \sin^2\alpha = 1 \Rightarrow \frac{4}{9} + \sin^2\alpha = 1 \Rightarrow \sin^2\alpha = \frac{5}{9}$$

$$\Rightarrow \sin\alpha = -\frac{\sqrt{5}}{3}$$

۶

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

$$\tan^2\alpha - 1 = \frac{\sin^2\alpha}{\cos^2\alpha} - 1 = \frac{\sin^2\alpha - \cos^2\alpha}{\cos^2\alpha} = \frac{\frac{5}{9} - \frac{4}{9}}{\frac{4}{9}} = \frac{\frac{1}{9}}{\frac{4}{9}} = \boxed{\frac{1}{4}}$$