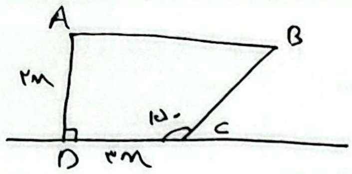
مدرسی کاظمی یازدهم پسرانه

۱۵,۲۵

① 

$x \cdot 3x = 54 \rightarrow 3x^2 = 54 \rightarrow x = 3\sqrt{2} \rightarrow (3x+3x)\cdot 2 = 36\sqrt{2}$ ✓ ۲

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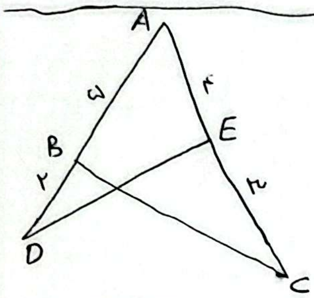
② 

$\frac{1}{2} \times 35 \sin A - \frac{1}{2} 28 \sin A = 1.75 = \frac{7}{2}\sin A \longrightarrow \sin A = \frac{1}{2}$ ۱,۵

$\tan A = \sqrt{\frac{\sin^2 A}{1-\sin^2 A}} = \frac{\sqrt{15}}{15}$

$S_\Delta = \frac{1}{2} ab \sin\alpha$

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③ ۲

$\frac{1}{\sqrt{\cos^2\alpha}} - \tan\alpha = \frac{1+\sin\alpha}{|\cos\alpha|}$ $\frac{|\sin\alpha|}{\cos\alpha} = -\frac{1}{\cot\alpha}$

$\frac{1}{|\cos\alpha|} - \frac{\sin\alpha}{\cos\alpha} = \frac{1+\sin\alpha}{|\cos\alpha|}$ → $\sin = 0$, $\cos\alpha < 0$

$\frac{|\sin\alpha|}{\cos\alpha} = -\frac{1}{\cot\alpha} \longrightarrow \cot\alpha \longrightarrow \sin\alpha \neq 0$

$\frac{|\sin\alpha|}{\cos\alpha} = -\frac{\sin\alpha}{\cos\alpha} \longrightarrow \sin\alpha < 0$ ناحیه سوم ✓

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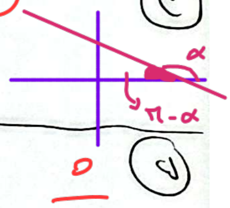
④ ۱,۵

ناحیه دوم متغیر $\tan\alpha = -\frac{3}{4} \longrightarrow \tan(\frac{\pi}{2}-\alpha) = \frac{\sin(\frac{\pi}{2}-\alpha)}{\cos(\frac{\pi}{2}-\alpha)} = \frac{\cos\alpha}{\sin\alpha} = \cot\alpha = -\frac{4}{3}$

$\tan(\pi-\alpha) = -\tan\alpha = \frac{3}{4} \rightarrow \tan\alpha = -\frac{3}{4}$



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⑤ ۰

$\frac{3\cos(248^\circ) - 2\sin(158^\circ)}{\sin(202^\circ) - \cos(292^\circ)} = -\frac{1}{2}$

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⑥ ۲

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

$\cos\alpha = \frac{2}{3}$

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⑦ ۲

$\sin\alpha = 2\cos\alpha$ $\sin^2\alpha + \cos^2\alpha = 1 \longrightarrow 4\cos^2\alpha + \cos^2\alpha = 1$

$|\cos\alpha| = \frac{\sqrt{5}}{5}$ $\cos\alpha = -\frac{\sqrt{5}}{5}$ ✓ ناحیه سوم

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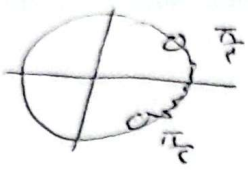
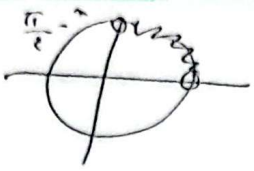
⑧ ۱,۷۵

$\frac{-2m}{m^2-1} = \tan 60 \rightarrow \sqrt{3}\, m^2 + 2m - \sqrt{3} = 0$ ✓

$\frac{-2 \pm 4}{2\sqrt{3}} = m \longrightarrow m = \frac{+1}{\sqrt{3}}$ ✓ , $-\sqrt{3}$

اختلاف → $\frac{4}{\sqrt{3}}$

۹ (۱,۵)

$\alpha < \tan(\frac{\pi}{۴} - m)$

$\frac{۱-m}{۲+m} > ۰ \rightarrow m \in (-۲, -۱)$ ✓

	-۲		۱
	$-$	$+$	$-$

$(-۲, ۱)$

۱۰ (۱)

$\tan(۱۲۰) \times \sin(۱۲۰) - \cot(۳۰) \times -\cos(۶۰)$ ✓

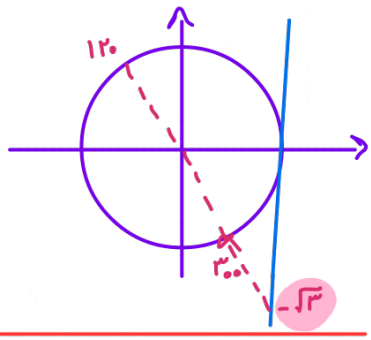
$-\sqrt{۳} \quad \frac{\sqrt{۳}}{۲} \quad -\sqrt{۳} \quad -\frac{\sqrt{۳}}{۲}$

~~$\frac{\cos^۲ ۶۰}{\sin ۶۰} + \frac{\sin ۲۱۰}{\cos ۲۱۰} = ۲(\frac{۱}{۴} + \frac{۳}{۴}) = ۲$~~

۱۰-

$$-\sqrt{۳}\left(-\frac{\sqrt{۳}}{۲}\right) + \tan\left(\frac{\pi}{۲} + ۳۰\right) \times \sin\left(\frac{\pi}{۲} + ۳۰\right)$$

$$\frac{۳}{۲} - \cot ۳۰ \times \cos ۳۰ = \frac{۳}{۲} - \left(\sqrt{۳} \times \frac{\sqrt{۳}}{۲}\right) = \frac{۳}{۲} - \frac{۳}{۲} = ۰$$



۵-

$$\frac{۳\cos(\frac{۳\pi}{۲} - ۲۲) - ۲\sin(\pi - ۲۲)}{\sin(\pi + ۲۲) - \cos(\frac{۳\pi}{۲} + ۲۲)} = \frac{-۳\sin ۲۲ - ۲\sin ۲۲}{-\sin ۲۲ - \sin ۲۲} = \boxed{\frac{۵}{۲}}$$

۲-

$$S_{ABC} - S_{ADE} = \frac{۱}{۲} \times ۷ \times ۵ \sin \hat{A} - \frac{۱}{۲} \times ۴ \times ۷ \times \sin \hat{A} = ۱,۷۵$$

$$\frac{۷}{۲} \sin \hat{A} = ۱,۷۵ \rightarrow \sin \hat{A} = \frac{۱}{۲} \xrightarrow{A = ۳۰^\circ} \tan \hat{A} = \frac{\sqrt{۳}}{۳}$$