آ/ کرمانی — پاسخنامه تشریحی شماره ۱ — یازدهم رشته ریاضی A/

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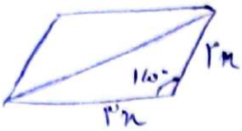
۱)



$54 = 2\left(\frac{1}{2} \times 2x \times 3x \times \sin 150^\circ\right) \Rightarrow \frac{54}{3} = x^2 \Rightarrow x = \sqrt{18} \Rightarrow$

محیط $= (2\sqrt{18} + 3\sqrt{18}) \times 2 = 10\sqrt{18}$

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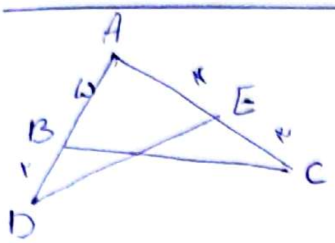
۲)



$|\widehat{ADE} - \widehat{ABC}| = 1.75$

$S_{ABC} = \frac{1}{2}\sin A \times 5 \times 7 = \frac{35}{2}\sin A$

$S_{ADE} = \frac{1}{2}\sin A \times 7 \times 4 = \frac{28}{2}\sin A$

$\Rightarrow \frac{7}{2}\sin A = 1.75 \Rightarrow \sin A = \frac{1}{2} \Rightarrow A = 30^\circ$

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$\tan 30^\circ = \frac{\sin 30^\circ}{\cos 30^\circ} = \frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$

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۳)

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

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

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$\frac{1}{|\cos\alpha|} - \frac{\sin\alpha}{\cos\alpha} = \frac{1+\sin\alpha}{|\cos\alpha|} \Rightarrow \frac{1}{|\cos\alpha|} - \frac{1}{|\cos\alpha|} - \frac{\sin\alpha}{\cos\alpha} = \frac{\sin\alpha}{|\cos\alpha|}$

$\cos < 0$ ② $\Rightarrow$ ① $\cap$ ② $\Rightarrow$ ناحیه سوم

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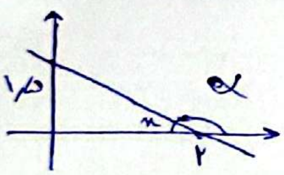
۴)



$\tan x = \frac{1.5}{2} \Rightarrow \tan x = \frac{3}{4} \Rightarrow \tan\alpha = -\frac{3}{4}$

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

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۵)

$\frac{3\cos(248) - 2\sin(158)}{\sin(202) - \cos(292)} = \frac{3\cos(270-22) - 2\sin(180-22)}{\sin(180+22) - \cos(270+22)} = \frac{-3\sin 22 - 2\sin 22}{-\sin 22 - \sin 22} = \frac{-5\sin 22}{-2\sin 22} = \frac{5}{2}$

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(6)

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

$$\sin\alpha=\sqrt{1-\cos^2\alpha}=\sqrt{1-\frac{4}{9}}=\frac{\sqrt{5}}{3}\ \overset{\text{ناحیه دوم}}{=}\ \frac{-\sqrt{5}}{3}$$

$$\frac{1}{\frac{4}{9}}-2=\frac{9}{4}-\frac{8}{4}=\frac{1}{4}$$

$$\frac{\frac{2}{3}-\frac{\sqrt{5}}{3}}{\frac{1}{4}}=\frac{\frac{2-\sqrt{5}}{3}}{\frac{1}{4}}=$$

$$\frac{4(2-\sqrt{5})}{3}=\frac{8-4\sqrt{5}}{3}=-\frac{17}{3}$$

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(7)

$$\frac{\sin\alpha}{2x}=\frac{2\cos\alpha}{x}\Rightarrow x^2+(2x)^2=1\Rightarrow x^2+4x^2=1\Rightarrow \frac{1}{5}=x^2=\frac{1}{\sqrt{5}}=-\frac{1}{\sqrt{5}}=\cos\alpha$$

ناحیه دوم

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

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(8)

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

$\tan 60^\circ=\sqrt{3}$

$$\sqrt{3}m^2+2m-\sqrt{3}=0\Rightarrow m^2+2m-3=0\ \begin{cases}m=\frac{-3}{\sqrt{3}}\\ m=\frac{1}{\sqrt{3}}\end{cases}\quad \frac{4\sqrt{3}}{3}$$

$$\frac{4\sqrt{3}}{3}$$

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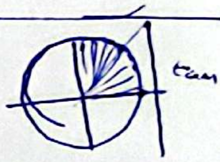
(9)

$$\frac{-\pi}{4}<x<\frac{\pi}{4},\quad \tan(\frac{\pi}{4}-x)=\frac{1-m}{2+m}$$



$$\frac{-\pi}{4}<x<\frac{\pi}{4}\Rightarrow\frac{-\pi}{4}<-x<\frac{\pi}{4}\rightarrow 0<\frac{\pi}{4}-x<\frac{\pi}{2}\Rightarrow$$

$$0<\frac{1-m}{2+m}\Rightarrow \begin{array}{c|c|c|c} & -2 & & 1 \\ - & & + & - \end{array}\Rightarrow -2<m<1$$

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(10)

$$\tan(300)\times\cos(210)+\tan(480)\sin(840)=\tan(\pi-60)\times\cos(\frac{3\pi}{2}-60)$$

$$\tan(\pi-60)\times\cos(\frac{3\pi}{2}-60)+\tan(2\pi+120)\sin(2\pi+120)=-\tan 60^\circ\times-\sin 60+\tan 120^\circ\times\sin 120$$

$$-\tan 60^\circ\times-\sin 60^\circ+(-\tan 120^\circ)\times\sin 120^\circ=\sqrt{3}\times-\frac{\sqrt{3}}{2}+(-\sqrt{3})(\frac{\sqrt{3}}{2})=0$$