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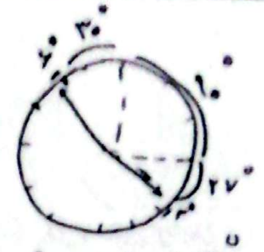
نام و نام خانوادگی: امیرعلی ماسی — پاسخنامه تشریحی تکلیف شماره ۱۹ — کلاس ۱۰A

۱ (نمره: ۲)

الف)



$36+90+27=153°$ ✓

ب)

$|5.5m - 30h| \to \left|\frac{55}{10}\times 54 - 30\times 3\right|$

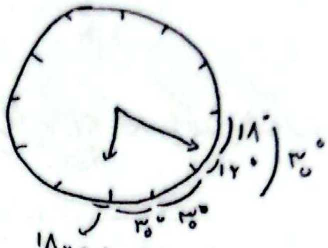
$= 297 - 90 = 207$

$360 - 207 = 153$ ✓

۲ (نمره: ۲)

الف)

$60+12+9 = 81°$ ✓



ب)

$|18\times 5.5 - 30\times 6| = 81$ ✓

۳ (نمره: ۱/۵)

الف)

$S_{OAB} = \frac{\alpha r^2}{2}$

$\Rightarrow \frac{\frac{\pi}{6}\times 3^2}{2} = \frac{3\pi}{4}$ ✓

ب)

$|AB| = \alpha r$

$\frac{\pi}{6}\times 3 = \frac{\pi}{2} + \overbrace{3+3}^{\text{دو تا شعاع}} = 6 + \frac{\pi}{2}$

محیط قطاع رو می‌خواهیم!

۴ (نمره: ۲)

الف)

$S_{ACB} = \frac{1}{2}\sin A \times AC \times AB$

$\frac{1}{2}\times\frac{\sqrt{3}}{2}\times 8\times 5 = 10\sqrt{3}$ ✓

ب)

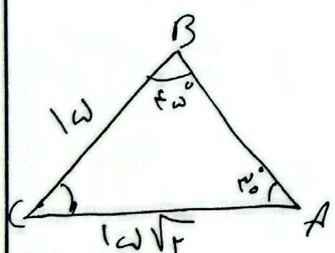
$CB = \sqrt{5^2+8^2-80\times\frac{1}{2}}$

$= \sqrt{49} = 7$ ✓

$P = 5+8+7 = 20$ ✓

۵ (نمره: ۲)

$A = 180 - (\hat{B}+\hat{C}) = 30°$



$\frac{15}{\sin A} = \frac{15\sqrt{2}}{\sin B} \Rightarrow \frac{15}{\frac{1}{2}} = \frac{15\sqrt{2}}{\sin B}$ ، $\sin B = \frac{15\sqrt{2}}{30} = \frac{\sqrt{2}}{2}$

$\hat{B} = 45°$

$C = 180 - (45+30) = 105$

$B = \frac{\pi}{4}$ ✓ $C = \frac{7\pi}{12}$ ✓

۶ (۲)

$$\frac{\tan(\pi-\alpha)+3\tan(\pi+\alpha)}{\tan(2\pi-\alpha)\cdot\tan(2\pi+\alpha)}=\frac{-\tan\alpha+3\tan\alpha}{-\tan\alpha-\tan\alpha}=-1$$

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۷ (۱٫۷۵)

$\tan 75° = \cot 15°$

$\tan 105° = -\cot 15°$

$\tan 165° = -\tan 15°$

$\tan 285° = -\cot 15°$

$$\Rightarrow \frac{2\cot 15° - \cot 15°}{-3\tan 15° - \cot 15°}=\frac{\cot 15°}{-\frac{1}{a}-3a}$$

[grader's additions: $\frac{1}{a}$, $-3a^2$, $-\frac{1}{a}$]

دقت!

$\frac{\pi}{12}=15°$

$$\Rightarrow \frac{\frac{1}{a}}{\frac{1-3a^2}{a}} = \frac{-1}{1+3a^2}$$

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۸ (۲)

$$\frac{\sin x+\cos x}{\sin x-\cos x}+\frac{\sin x-\cos x}{\sin x+\cos x}=\frac{2\sin^2 x+2\cos^2 x}{\sin^2-\cos^2}=\frac{2\sin^2 x+2(1-\sin^2 x)}{\sin^2 x-(1-\sin^2 x)}$$

مخرج مشترک

$$\frac{2\sin^2 x+2-2\sin^2 x}{2\sin^2 x-1}=3 \Rightarrow 6\sin^2 x-3=2$$

$6\sin^2 x=5 \quad \sin^2=\frac{5}{6} \quad \cos^2=\frac{1}{6}$

$$\tan^2=\frac{\frac{5}{6}}{\frac{1}{6}}=5$$

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۹ (۲)

$$\frac{\sin^2 x-2(1-\sin^2 x)+1}{\sin^2 x+2(1-\sin^2 x)-1}=\frac{\sin^2 x-2+2\sin^2 x+1}{\sin^2 x+2-2\sin^2 x-1}=\frac{3\sin^2 x-1}{1-\sin^2 x}=4$$

$$4-4\sin^2 x=3\sin^2 x-1 \Rightarrow 7\sin^2 x=5$$

$\sin^2=\frac{5}{7} \quad \cos^2=\frac{2}{7}$

$$\tan^2=\frac{\frac{5}{7}}{\frac{2}{7}}=\frac{5}{2}$$

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الف) (۱٫۷۵)

$$\cos(22{,}5°) \xRightarrow{\text{توان رسانی}} \cos^2(22{,}5°)=\frac{1+\cos(2\times 22{,}5°)}{2}=\frac{\frac{2+\sqrt{2}}{2}}{2}$$

$$\cos(22{,}5°)=\sqrt{\frac{2+\sqrt{2}}{4}}=\frac{\sqrt{2+\sqrt{2}}}{2}$$

ب)

$$\sin(67{,}5°) \xRightarrow{\text{توان ۲}} \sin^2(67{,}5°)=\frac{1-\cos(67{,}5°\times 2)}{2}=\frac{1+\frac{\sqrt{2}}{2}}{2}$$

[grader's annotation: $-\frac{\sqrt{2}}{2}$]

$$\frac{\frac{2-\sqrt{2}}{2}}{\frac{2}{1}}=\frac{2-\sqrt{2}}{4} \qquad \sin=\frac{\sqrt{2+\sqrt{2}}}{2}$$