۲۰

دبیرستان پرتو پرورش ۲	تکلیف شماره ۱۸ مثلثات	کلاس دهم A دختر جمعه ۱۸:۳۰ و ۱۶:۳۰

۱

الف) $\tan\frac{11\pi}{4} + \sin\frac{15\pi}{4}\cos\frac{13\pi}{4} = -1 + \left(-\frac{\sqrt{2}}{2} \times \left(-\frac{\sqrt{2}}{2}\right)\right) = -1 + \frac{1}{2} = -\frac{1}{2}$

ب) $\tan\frac{17\pi}{6}\sin\frac{11\pi}{3} + \cos\frac{10\pi}{3} = \underbrace{\frac{\sqrt{3}}{3} \times \left(-\frac{\sqrt{3}}{2}\right)}_{\frac{3}{6}} + \left(-\frac{1}{2}\right) = \frac{1}{2} - \frac{1}{2} = 0$

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$\frac{3\cos x - \sin x}{\cos x + \sin x} \xrightarrow[\div \sin x]{\text{صورت و مخرج}} \frac{3\cot x - 1}{\cot x + 1} \xrightarrow{\cot x = 4}$

$= \frac{12 - 1}{4 + 1} = \frac{11}{5}$

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$\sin\alpha = 2\cos\alpha$ ، α ربع ۳ $\qquad \sin^2 x + \cos^2 x = 1 \Rightarrow (2\cos\alpha)^2 + \cos^2\alpha = 1$

$4\cos^2\alpha + \cos^2\alpha = 5\cos^2\alpha = 1 \Rightarrow \cos\alpha = \pm\sqrt{\frac{1}{5}} \xrightarrow{\text{ربع ۳}} -\frac{\sqrt{5}}{5}$

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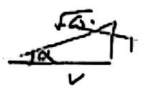
الف) $\sin\alpha = \frac{\sqrt{2}}{10} \Rightarrow \cos = \frac{-7}{5\sqrt{2}} = \frac{-7\sqrt{2}}{10} \qquad \cos\left(11\frac{\pi}{4} + \alpha\right) = \cos\left(3\frac{\pi}{4} + \alpha\right) =$

$\cos 3\frac{\pi}{4} \times \cos\alpha - \sin\frac{3\pi}{4} \times \sin\alpha = -\frac{\sqrt{2}}{2} \times \left(\frac{-6}{5\sqrt{2}}\right) = \frac{3}{5}$

ب) $\sin\left(\frac{13\pi}{4} + \alpha\right) = \sin\left(\frac{5\pi}{4} + \alpha\right) = -\sin\left(\frac{\pi}{4} + \alpha\right)$ ①



$\sin\left(\frac{\pi}{4} + \alpha\right) = \sin\frac{\pi}{4}\cos\alpha + \cos\frac{\pi}{4} \times \sin\alpha =$

$\frac{\sqrt{2}}{2}(\sin\alpha + \cos\alpha) = \frac{\sqrt{2}}{2}\left(\frac{1}{\sqrt{50}} + \frac{7}{\sqrt{50}}\right) = \frac{4}{5}$ ② $\qquad$ ۱ و ۲ $\Rightarrow -\frac{4}{5}$

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$2\sin^2 x + \cos^2 x = \frac{4}{3} \qquad \tan^2 x = ?$

$\sin^2 x + \underbrace{\sin^2 x + \cos^2 x}_{1} = \frac{4}{3} \Rightarrow \sin^2 x = \frac{1}{3} \qquad 1 + \cot^2 x = \frac{1}{\sin^2 x} = 3$

$\cot^2 = 2 \Rightarrow \tan^2 = \frac{1}{2}$

$\frac{1}{2} \times 6 \times \sqrt{3} \times \sin\alpha = 3\sqrt{3}\sin\alpha = 4,5$

$\sin\alpha = \frac{4,5}{3\sqrt{3}} = \frac{3}{2} \times \frac{\sqrt{3}}{3} = \frac{\sqrt{3}}{2} \Rightarrow$ ب: ۱۲۰ ج: ۶۰

$\frac{120}{60} = 2$ ۶

$\frac{a}{b} = \frac{2}{3} \Rightarrow b = \frac{3}{2}a$ $\quad S = ab\sin\alpha$

$S = a \times \frac{3}{2}a \times \frac{1}{2} = \frac{3}{4}a^2 = 24$ $\quad a^2 = 72 \Rightarrow a = 6\sqrt{2}$ ✓

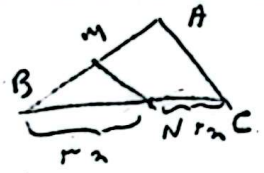
$b = \frac{3}{4} \times 6\sqrt{2} = 9\sqrt{2}$

$P = 18\sqrt{2} + 12\sqrt{2} = 30\sqrt{2}$

$S_{ABC} = \frac{1}{2} \times 5 \times 7 \times \sin A$ } $\Rightarrow S_{ABC} - S_{ADE} = \frac{7}{2}\sin A(5-4)$
$S_{ADE} = \frac{1}{2} \times 7 \times 4 \times \sin A$ ۸

$\frac{7}{2}\sin A = 1,75$ $\quad \sin A = \frac{1,75}{\frac{7}{2}} = 0,5 = \frac{1}{2}$

$A = 30^\circ$ $\quad \tan 30^\circ = \frac{\sqrt{3}}{3}$



$2BN = 3NC \rightarrow \frac{BN}{NC} = \frac{3}{2}$

$\frac{S_{ABC}}{S_{BMN}} = \frac{\frac{1}{2}AB \cdot BC \sin B}{\frac{1}{2}BM \cdot BN \sin B} = \frac{AB \times BC}{BM \times BN} = \frac{5AB}{2BM} = 3$ ۹

$5AB = 9BM \Rightarrow \frac{BM}{AB} = \frac{5}{9} \rightarrow AB = 9d, MB = 5d, MA = 4d$

$\frac{BM}{AM} = \frac{5}{4} = 1,25$

$\frac{|\sin\alpha|}{\cos\alpha} = -\tan\alpha = -\frac{\sin\alpha}{\cos\alpha} \Rightarrow |\sin\alpha| = -\sin\alpha \Rightarrow$ ① ناحیه ۳ و ۴ $\Rightarrow \alpha < 0$

$\frac{1}{|\cos\alpha|} - \frac{\sin\alpha}{\cos\alpha} = \frac{1+\sin\alpha}{|\cos\alpha|}$ $\begin{cases} \cos\alpha > 0 & 1-\sin\alpha = 1+\cos\alpha \Rightarrow \alpha = 0 \\ \cos\alpha < 0 & \text{همواره برقرار} \Rightarrow \text{② ناحیه ۲ و ۳} \end{cases}$ ۱۰

ناحیه ۲ و ۳ $\Rightarrow$ ۱ و ۲