آیدین اشرفی - گروه A تکلیف ۱۸ **۱۸,۲۵**

۱) الف) $\tan \frac{11\pi}{4} + \sin \frac{15\pi}{4} \cos \frac{13\pi}{4} = \tan \frac{3}{4}\pi + \sin \frac{7}{4}\pi \cos \frac{5}{4}\pi$

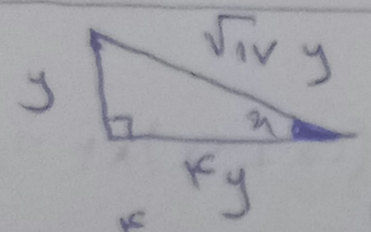
$-1 \qquad -\frac{\sqrt{2}}{2} \qquad -\frac{\sqrt{2}}{2}$ ۱,۷۵

$= -1 + \frac{1}{2} = -\frac{1}{2}$ ✓

ب) $\tan \frac{17}{6}\pi \sin \frac{11}{3}\pi + \cos \frac{10}{3}\pi = \tan \frac{5}{6}\pi \sin \frac{5}{3}\pi + \cos \frac{4}{3}\pi$

$= \left(-\frac{\sqrt{3}}{3}\right) \times \left(-\frac{\sqrt{3}}{2}\right) - \frac{1}{2} = \cancel{-\frac{1}{6}}$ ۰

۲) ۲

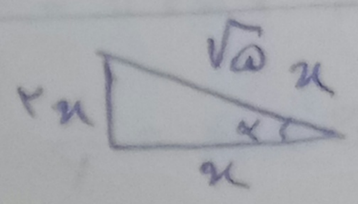


$\sin x = \frac{1y}{\sqrt{17}y}$, $\cos x = \frac{4y}{\sqrt{17}y}$

$\frac{3 \times \frac{4}{\sqrt{17}} - \frac{1}{\sqrt{17}}}{\frac{4}{\sqrt{17}} + \frac{1}{\sqrt{17}}} = \frac{11}{5}$ ✓

۳) ۲

$\sin\alpha = 2\cos\alpha \Rightarrow \tan\alpha = 2$



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

۴) ۱,۵

الف) بر اساس روابط:

(I) $\cos(\alpha+\beta) = \cos\alpha\cos\beta - \sin\alpha\sin\beta$

(II) $\sin(\alpha+\beta) = \sin\alpha\cos\beta + \sin\beta\cos\alpha$

$\cos\left(\frac{11}{4}\pi + \alpha\right) = \cos\left(\frac{3}{4}\pi + \alpha\right) = \cos\frac{3}{4}\pi \cos\alpha - \sin\frac{3}{4}\pi \sin\alpha$

$-\frac{\sqrt{2}}{2} \qquad -\frac{7}{5\sqrt{2}} \qquad \frac{\sqrt{2}}{2} \qquad \frac{\sqrt{2}}{10}$

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

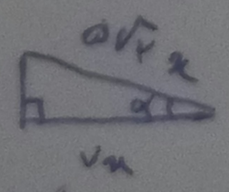
$1 - \frac{2}{100} = \cos^2\alpha \quad \frac{98}{100} = \cos^2\alpha \Rightarrow \boxed{\cos\alpha = \frac{-7}{5\sqrt{2}}}$ ربع دوم!

$\Rightarrow -\frac{\sqrt{2}}{2} \times \frac{7}{5\sqrt{2}} - \frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{10} = \frac{-7}{10} - \frac{1}{10} = -\frac{8}{10} \propto \boxed{\frac{4}{5}}$ ← جواب الف

ب) $\sin\left(\frac{13\pi}{4} + \alpha\right) = \sin\left(3\pi + \frac{\pi}{4} + \alpha\right) = -\sin\left(\frac{\pi}{4} + \alpha\right)$

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

$\tan\alpha = \frac{1}{7}$



$\boxed{\sin\alpha = \frac{1}{5\sqrt{2}}}$ ✓ $\boxed{\cos\alpha = \frac{7}{5\sqrt{2}}}$ ✓

$= -\frac{\sqrt{2}}{2} \times \frac{7}{5\sqrt{2}} + \frac{1}{5\sqrt{2}} \times \frac{\sqrt{2}}{2} = \frac{-7}{10} + \frac{1}{10} = -\frac{8}{10}$ ← جواب ب

۵) ۲

$\tan^2 x = \frac{\sin^2 x}{\cos^2 x} = \frac{\frac{1}{3}}{\frac{2}{3}} = \frac{1}{2}$ ✓ ← جواب آخر

$2\sin^2 x + \cos^2 x = \frac{4}{3} \Rightarrow \sin^2 x = \frac{4}{6} - \frac{4}{3} = \frac{1}{3}$

$\Rightarrow \cos^2 x = 1 - \frac{1}{3} = \frac{2}{3}$

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

$\sin\alpha = \frac{4/5}{3\sqrt{3}} = \frac{9/2}{3\sqrt{3}} = \frac{3}{2\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{3\sqrt{3}}{2 \times 3} = \frac{\sqrt{3}}{2}$ ۶ ۲

$\alpha = 60^\circ$ و 120°

کمترین — بیشترین

$\frac{120^\circ}{60^\circ} = 2$ دو برابر

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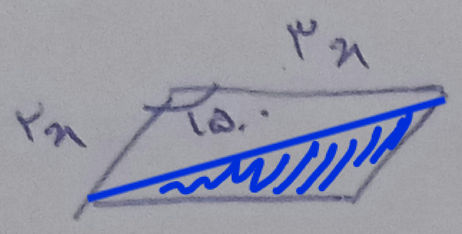
مساحت هاشور خورده



مساحت متوازی الاضلاع

$S = \left(\frac{3x \times 2x \times \sin 150^\circ}{2}\right) \times 2 = 54$

متوازی الاضلاع

$3x^2 = 108 = 54$ $x^2 = \frac{108}{3} = 36 \Rightarrow \boxed{x = -6}$ محیط $= (2x + 3x) \times 2 = 60$

جواب

$x = 3\sqrt{2} \longrightarrow P = 10x = \boxed{30\sqrt{2}}$

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۸ ۲

$\frac{1}{2}\sin A \times 5 \times 7 - \frac{1}{2}\sin A \times 7 \times 4 = 1/75$

$\sin A = \frac{1}{2} \xrightarrow{\hat{A} = 30^\circ} \tan A = \frac{\sqrt{3}}{3}$

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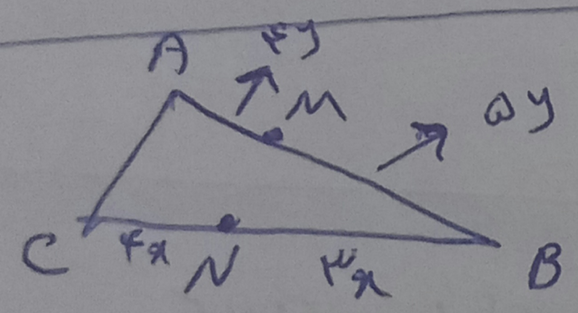
۹ ۲



$\frac{S_{BMN}}{S_{ABC}} = \frac{\frac{1}{2}\sin A \times BM \times BN}{\frac{1}{2}\sin A \times AB \times BC} = \frac{1}{3}$

$\frac{BM \times 3x}{AB \times 5x} = \frac{1}{3}$ $\frac{BM}{AB} = \frac{5}{9}$

$AB = AM + MB = 4y + 5y \Rightarrow \boxed{\frac{BM}{AM} = \frac{5}{4}}$

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۱۰ ۲

$-\tan\alpha = \frac{\sin\alpha}{|\cos\alpha|}$ $\cos\alpha < 0$ (I)

از رابطه (I) و (II) $\Rightarrow$ ناحیه ۳

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