

۲۰ عالی نوشتن!

$$\text{الف) } \tan \frac{11\pi}{6} + \sin \frac{13\pi}{6} \cos \frac{13\pi}{6} = \frac{1\pi + 3\pi}{6} + \frac{14\pi - \pi}{6} \times \frac{12\pi + \pi}{6} =$$

$$\tan \frac{3\pi}{6} + \sin(-\frac{\pi}{6}) \times \cos(-\frac{\pi}{6}) = -1 + (-\frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{2}) = -1 + \frac{1}{2} = -\frac{1}{2} \checkmark$$

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$$\text{ب) } \tan \frac{14\pi}{6} \sin \frac{11\pi}{6} + \cos \frac{10\pi}{6} = \tan \frac{7\pi}{3} \sin(-\frac{\pi}{6}) + \cos \frac{5\pi}{3} =$$

$$(-\frac{\sqrt{3}}{2}) \times (-\frac{\sqrt{3}}{2}) + (-\frac{1}{2}) = \frac{3}{4} - \frac{1}{2} = 0 \checkmark$$

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$$\cot x = \frac{\cos x}{\sin x} = c \rightarrow \cos x = c \sin x$$

$$\frac{c(\sin x) - \sin x}{c \sin x + \sin x} = \frac{12 \sin x - \sin x}{2 \sin x} = \frac{11 \sin x}{2 \sin x} = \frac{11}{2} \checkmark$$

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$$\sin^2 \alpha + \cos^2 \alpha = 1 \quad \sin \alpha = 2 \cos \alpha \rightarrow (2 \cos \alpha)^2 + \cos^2 \alpha = 1 \rightarrow 5 \cos^2 \alpha = 1$$

$$\cos^2 \alpha = \frac{1}{5} \rightarrow \cos \alpha = \pm \frac{1}{\sqrt{5}} \quad \text{بجای} \rightarrow \cos \alpha = -\frac{1}{\sqrt{5}} \checkmark$$

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$$\text{الف) } \cos(\frac{11\pi}{6} + \alpha) = \cos(\frac{3\pi}{6} + \alpha) \quad \cos \frac{3\pi}{6} = -\frac{\sqrt{3}}{2} \quad \sin \frac{3\pi}{6} = \frac{\sqrt{3}}{2} \quad \sin \alpha = \frac{\sqrt{2}}{10}$$

$$\cos^2 \alpha = 1 - (\frac{\sqrt{2}}{10})^2 = 1 - \frac{2}{100} = 1 - \frac{1}{50} = \frac{49}{50} \quad \cos \alpha = \pm \frac{7}{\sqrt{50}} = \pm \frac{\sqrt{2}}{5} \quad \text{بجای} \rightarrow -\frac{\sqrt{2}}{5}$$

$$\cos(\frac{3\pi}{6} + \alpha) = (-\frac{\sqrt{3}}{2})(-\frac{\sqrt{2}}{5}) - (\frac{\sqrt{3}}{2})(\frac{\sqrt{2}}{5}) = \frac{\sqrt{6}}{10} - \frac{\sqrt{6}}{10} = 0 \checkmark$$

$$\text{ب) } \sin(\frac{11\pi}{6} + \alpha) = \sin(\frac{3\pi}{6} + \alpha) \quad \sin \frac{3\pi}{6} = \frac{1}{2} \quad \cos \frac{3\pi}{6} = -\frac{\sqrt{3}}{2} \quad \sin \alpha = \frac{\sqrt{2}}{10}$$

$$\sin(\frac{3\pi}{6} + \alpha) = (\frac{1}{2})(\frac{\sqrt{2}}{5}) + (-\frac{\sqrt{3}}{2})(\frac{\sqrt{2}}{5}) = \frac{\sqrt{2}}{10} - \frac{\sqrt{6}}{10} = \frac{\sqrt{2} - \sqrt{6}}{10} \checkmark$$

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$$\text{ب) } \tan \alpha + 1 = \frac{1}{\cos^2 \alpha} \quad 1 + \frac{1}{16} = \frac{1}{\cos^2 \alpha} \quad \cos \alpha = \frac{4}{5} - \frac{\sqrt{2}}{10}$$

$$\sin(\frac{5\pi}{6} + \alpha) = (-\frac{\sqrt{3}}{2}) \cos \alpha + (-\frac{1}{2}) \sin \alpha = -\frac{\sqrt{3}}{2} (\sin \alpha + \cos \alpha) = -\frac{4}{5} \checkmark$$

$$\cos^2 x + 2 \sin^2 x = \frac{5}{4} \quad \sin^2 x + \cos^2 x = 1 \rightarrow (1 - \sin^2 x) + 2 \sin^2 x = \frac{5}{4}$$

$$1 + \sin^2 x = \frac{5}{4} \quad \sin^2 x = \frac{5}{4} - 1 = \frac{1}{4}$$

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$$\rightarrow \cos^2 x = 1 - \sin^2 x = 1 - \frac{1}{4} = \frac{3}{4}$$

$$\rightarrow \tan^2 x = \frac{\sin^2 x}{\cos^2 x} = \frac{\frac{1}{4}}{\frac{3}{4}} = \frac{1}{3} = \frac{1}{3} \checkmark$$

$$S_{\triangle ABC} = \frac{1}{2} \times \sqrt{2} \times 4 \times \sin \alpha = 2\sqrt{2} \rightarrow \sin \alpha = \frac{\sqrt{2}}{2} \begin{cases} 45^\circ \checkmark \\ 135^\circ \checkmark \\ 225^\circ \times \\ 315^\circ \times \end{cases}$$

$$\frac{12}{-4} = 3 \checkmark$$

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$$\left. \begin{array}{l} \text{منبع اول} = 2K \\ \text{منبع دو} = 2K \\ S = a \times b \times \sin \theta \end{array} \right\} 2K \times 2K \times \frac{\sin 120^\circ}{\frac{1}{2}} = 24 \rightarrow 4K^2 \times \frac{1}{2} = 24$$

$$2K^2 = 24$$

$$K^2 = 12$$

$$K = \sqrt{12} = 2\sqrt{3}$$

$$\rightarrow \text{منبع اول} = 2K = 2 \times 2\sqrt{3} = 4\sqrt{3}$$

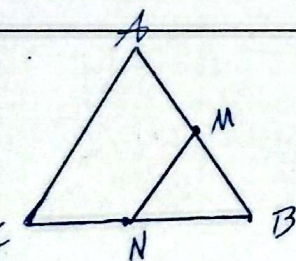
$$\text{منبع دو} = 2K = 2 \times 2\sqrt{3} = 4\sqrt{3}$$

$$\text{مجموع} \rightarrow 2(a+b) = 2(4\sqrt{3} + 4\sqrt{3}) = 16\sqrt{3} \checkmark$$

$$\triangle ABC > \triangle ADE \rightarrow \frac{1}{2} \times 4 \times 2 \times \sin \hat{A} - \frac{1}{2} \times 4 \times 2 \times \sin \hat{A} = \frac{2 \times 2 \times \sin \hat{A}}{2} - \frac{2 \times 2 \times \sin \hat{A}}{2} = 1, \sqrt{2}$$

$$\frac{4 \sin \hat{A}}{2} = 1, \sqrt{2} \rightarrow 4 \sin \hat{A} = 2\sqrt{2} \rightarrow \sin \hat{A} = \frac{\sqrt{2}}{2} = \frac{1}{\sqrt{2}} \rightarrow \begin{cases} 45^\circ \checkmark \\ 135^\circ \times \end{cases}$$

$$\tan 45^\circ = \frac{1}{1} \checkmark$$



$$\overline{NC} = \frac{1}{2} \overline{BN} \rightarrow \overline{BC} = \frac{3}{2} \overline{BN} \quad \overline{AM} + \overline{MB} = \overline{AB}$$

$$\frac{\frac{1}{2} \times \overline{AB} \times \overline{BC} \times \sin \hat{B}}{\frac{1}{2} \times \overline{MB} \times \overline{BN} \times \sin \hat{B}} = 2 \rightarrow \frac{\overline{AB}}{\overline{MB}} = \frac{3}{1}$$

$$\rightarrow 2AM + 2BM = 3BM$$

$$2AM = BM$$

$$\frac{BM}{AM} = \frac{2}{1} \checkmark$$

$$\frac{|\sin \alpha|}{\cos \alpha} = \frac{-1}{\frac{\cos \alpha}{\sin \alpha}} \rightarrow \frac{|\sin \alpha|}{\cos \alpha} = -\frac{\sin \alpha}{\cos \alpha} \rightarrow \sin \alpha \Rightarrow (-)$$

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

$$\rightarrow \frac{|\cos \alpha|}{\cos \alpha} \times \sin \alpha = \sin \alpha \rightarrow \cos \alpha \Rightarrow \text{مطلوب} \checkmark$$

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