

نام و نام خانوادگی پاسخنامه تشریحی تکلیف شماره .../... کلاس ... (هم دختر) ...

$$\text{الف) } \tan\left(2\pi + \frac{3\pi}{4}\right) + \sin\left(2\pi + \frac{3\pi}{4}\right) \cos\left(2\pi + \frac{\pi}{4}\right) = \tan\left(\frac{3\pi}{4}\right) + \left(\underbrace{\left(-\sin\left(\frac{3\pi}{4}\right)\right)}_{-\frac{\sqrt{2}}{2}}\right) \left(\underbrace{\left(-\cos\left(\frac{\pi}{4}\right)\right)}_{-\frac{\sqrt{2}}{2}}\right) = \frac{-1}{2}$$

1

$$\text{ب) } \tan\left(2\pi + \frac{5\pi}{9}\right) \sin\left(2\pi + \frac{5\pi}{9}\right) + \cos\left(2\pi + \frac{4\pi}{9}\right) = \tan(180^\circ) \sin(180^\circ) + \cos(180^\circ) = 0$$

2

$$\cot \alpha = k = \frac{\cos \alpha}{\sin \alpha} \Rightarrow \cos \alpha = k \sin \alpha \Rightarrow \sin \alpha = \frac{1}{k} \cos \alpha \Rightarrow \frac{3 \cos \alpha - \frac{\cos \alpha}{k}}{\cos \alpha + \frac{\cos \alpha}{k}} = \frac{\frac{11}{k} \cos \alpha}{\frac{k+1}{k} \cos \alpha} = \frac{11}{k+1} \leftarrow \text{الف}$$

$$\text{الف) } \begin{cases} \cos \alpha = k \\ \sin \alpha = k \end{cases} \rightarrow \frac{3(k) - k}{k + k} = \frac{11k}{2k} = \frac{11}{2}$$

3

$$\text{الف) } \rightarrow \sin \alpha = 2 \cos \alpha \Rightarrow \sin^2 \alpha = 4 \cos^2 \alpha = 4(1 - \sin^2 \alpha) \Rightarrow 5 \cos^2 \alpha = 1 \rightarrow \cos^2 \alpha = \frac{1}{5}$$

$$\rightarrow \cos \alpha = \pm \sqrt{\frac{1}{5}} \Rightarrow \cos \alpha = \pm \frac{\sqrt{5}}{5}$$

$$\text{الف) } \rightarrow \tan \alpha = \frac{\sin \alpha}{\cos \alpha} = \frac{2 \cos \alpha}{\cos \alpha} = 2 \rightarrow \tan^2 \alpha = 4 \rightarrow \tan \alpha = \pm 2 \rightarrow \frac{1}{\cos^2 \alpha} = 5 \rightarrow \cos^2 \alpha = \frac{1}{5}$$

4

$$\text{الف) } \cos \alpha = \sqrt{1 - \sin^2 \alpha} = -\sqrt{\frac{89}{100}} = -\frac{\sqrt{89}}{10} \rightarrow \cos(\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta$$

$$\Rightarrow \cos\left(\alpha + \frac{3\pi}{4}\right) = \cos \alpha \cos \frac{3\pi}{4} - \sin \alpha \sin \frac{3\pi}{4} = \frac{+\sqrt{2}}{10} \cdot \frac{-\sqrt{2}}{2} - \frac{-\sqrt{89}}{10} \cdot \frac{\sqrt{2}}{2} = \frac{+1}{10} - \frac{-\sqrt{89}}{10} = \frac{1 + \sqrt{89}}{10}$$

$$\text{ب) } \tan \alpha = 1 \rightarrow \frac{\sin \alpha}{\cos \alpha} = 1 \Rightarrow \sin \alpha = \cos \alpha \Rightarrow \cos \alpha = \frac{\sqrt{2}}{2} \rightarrow \sin \alpha = \frac{\sqrt{2}}{2} \rightarrow \sin^2 \alpha + \cos^2 \alpha = 1 \Rightarrow \frac{2}{4} + \frac{2}{4} = 1$$

$$\sin(\alpha + \beta) = \sin \alpha \cos \beta + \sin \beta \cos \alpha \rightarrow \sin\left(\alpha + \frac{5\pi}{6}\right) = \sin \alpha \cos \frac{5\pi}{6} + \sin \frac{5\pi}{6} \cos \alpha = \frac{\sqrt{2}}{2} \cdot \frac{-\sqrt{3}}{2} + \frac{\sqrt{3}}{2} \cdot \frac{\sqrt{2}}{2} = \frac{-\sqrt{6}}{4} + \frac{\sqrt{6}}{4} = 0$$

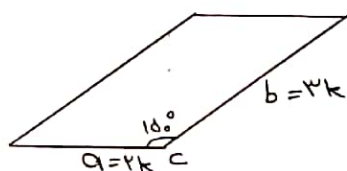
5

$$\begin{aligned} & \frac{3 \sin \alpha + \cos \alpha}{\sin \alpha + \cos \alpha} = \frac{5}{3} \rightarrow \frac{3 \sin \alpha + \cos \alpha}{\sin \alpha + \cos \alpha} = \frac{5}{3} \Rightarrow 3(3 \sin \alpha + \cos \alpha) = 5(\sin \alpha + \cos \alpha) \\ & \rightarrow \frac{1}{\cos \alpha} = 1 + \tan \alpha \rightarrow \frac{1}{\frac{1}{3}} = 1 + \tan \alpha \rightarrow \frac{1}{\frac{1}{3}} = \tan \alpha \rightarrow \tan \alpha = \frac{1}{3} \end{aligned}$$

$$\Rightarrow \Delta_{ABC} = \frac{1}{2} \sin \alpha \times 9\sqrt{2} = \frac{9\sqrt{2}}{2} \sin \alpha = 9\sqrt{2} \Rightarrow \sin \alpha = \frac{\sqrt{2}}{2} \Rightarrow 0 < \alpha < 180^\circ$$

$$\begin{cases} \alpha = 135^\circ \\ \alpha = 45^\circ \end{cases}$$

$$\Rightarrow \frac{135^\circ}{45^\circ} = 3$$



$$S_{\square} = ab \sin \hat{C} = \frac{1}{2} ab \sin 180^\circ \Rightarrow ab = 10.1$$

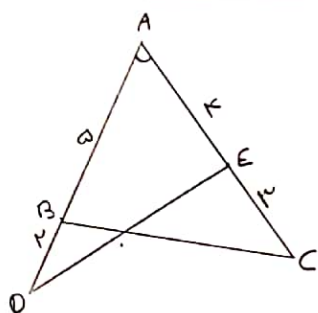
$$\begin{cases} b = 3k \\ a = 2k \end{cases} \Rightarrow 9k^2 = 10.1$$

$$k^2 = 1.1$$

$$k = \pm \sqrt{1.1}$$

$$\frac{1}{2} = 2(a+b) = 2(2\sqrt{1.1} + 3\sqrt{1.1}) \leftarrow a = 2(\sqrt{1.1}) = 2\sqrt{1.1} \quad b = 3(2\sqrt{1.1}) = 6\sqrt{1.1}$$

$$= 30\sqrt{1.1}$$



$$\Delta_{ABC} = \frac{1}{2} \sin \hat{A} \times 2 \times 6 = 6 \sin \hat{A}$$

$$\Delta_{ADE} = \frac{1}{2} \sin \hat{A} \times 2 \times 3 = 3 \sin \hat{A}$$

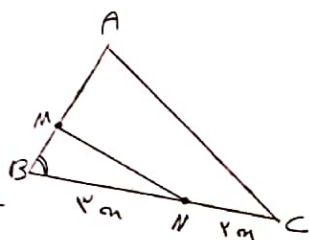
$$\Rightarrow \Delta_{ABC} - \Delta_{ADE} = \left(\frac{6}{2} - \frac{3}{2} \right) \sin \hat{A} = \frac{3}{2} \sin \hat{A} = 1.1$$

$$\Rightarrow \sin \hat{A} = 0.733 \Rightarrow \hat{A} = 47.3^\circ$$

$$\tan \hat{A} = \frac{\sqrt{2}}{2} \Rightarrow \tan 45^\circ = \frac{\sqrt{2}}{2}$$

$$(\Delta_{ABC} = \frac{1}{2} \sin \hat{A} \times 2 \times 6)$$

$$2BM = 2NC \Rightarrow \begin{cases} BM = 2m \\ NC = 2m \end{cases}$$



$$\Delta_{ABC} = \frac{1}{2} \sin \hat{B} \times 2m \times 2m = 2m^2 \sin \hat{B}$$

$$\Delta_{BMN} = \frac{1}{2} \sin \hat{B} \times 2m \times 2m = 2m^2 \sin \hat{B}$$

$$\Delta_{ABC} - \Delta_{BMN} = 2m^2 \sin \hat{B} - 2m^2 \sin \hat{B} = 0$$

$$\Delta_{AB} = 9 \Delta_{BM} \Rightarrow AB = 3 \Delta_{BM}$$

$$\Rightarrow AM = AB - BM = (3 - 1) \Delta_{BM} = 2 \Delta_{BM}$$

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

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

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

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