

تکلیف ۱۸

$$\tan \frac{11\pi}{4} + \sin \frac{10\pi}{4} \cos \frac{13\pi}{4}$$

سوال (۱)

$$\tan \left( \pi - \frac{\pi}{4} \right) + \sin \left( 2\pi - \frac{\pi}{4} \right) \cos \left( \pi + \frac{\pi}{4} \right) = -\tan \left( \frac{\pi}{4} \right) + \left( -\sin \left( \frac{\pi}{4} \right) \right) \times \left( -\cos \left( \frac{\pi}{4} \right) \right)$$

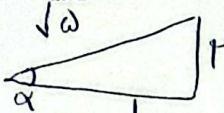
$$-1 + \left( -\frac{\sqrt{2}}{2} \right) \times \left( -\frac{\sqrt{2}}{2} \right) = -1 + \frac{1}{2} = \boxed{-\frac{1}{2}}$$

$$\tan \frac{11\pi}{4} \sin \frac{11\pi}{4} + \cos \frac{10\pi}{4} = \tan \left( \frac{3\pi}{4} \right) \sin \left( \frac{3\pi}{4} \right) + \cos \left( \frac{\pi}{2} \right) = \frac{1}{\sqrt{2}} - \frac{1}{\sqrt{2}} = \boxed{0}$$

سوال (۲)

$$\frac{r \cos \alpha - \sin \alpha}{\cos \alpha + \sin \alpha} \div \sin \alpha = \frac{r \cot \alpha - 1}{\cot \alpha + 1} = \frac{r \times 1 - 1}{1 + 1} = \frac{11}{2}$$

چون بیضی

$$\frac{-\sqrt{5}}{5} = \cos \alpha = \frac{-1}{\sqrt{5}} = \frac{-\sqrt{5}}{5}$$


سوال (۳)

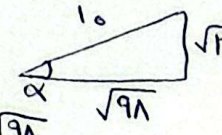
$$\sin \alpha = r \cos \alpha$$

$$\tan \alpha = \frac{\sin \alpha}{\cos \alpha} = r$$

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

$$\frac{11\pi}{4} = 2\pi + \frac{3\pi}{4} \Rightarrow \frac{-\sqrt{2}}{2} \cos \alpha - \frac{1}{2} \sin \alpha = \frac{\sqrt{194}}{10} - \frac{1}{10} = \frac{11}{10} - \frac{1}{10} = \frac{10}{10} = \boxed{1}$$

سوال (۴) الف

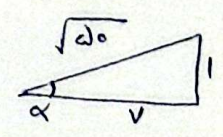


$$\cos \alpha = \frac{\sqrt{98}}{10}$$

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

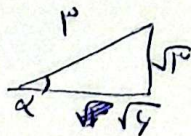
$$\frac{13\pi}{4} = 2\pi + \frac{5\pi}{4} \Rightarrow \frac{-\sqrt{2}}{2} \cos \alpha + \frac{1}{2} \sin \alpha = \frac{1}{\sqrt{2}} \left( \frac{-\sqrt{2}}{2} + \left( -\frac{1}{2} \right) \right) = \frac{1}{2} (-1) = \boxed{-\frac{1}{2}}$$

ب



$$\cos \alpha = \frac{1}{\sqrt{2}}, \sin \alpha = \frac{1}{\sqrt{2}}$$

$$\tan^r = \left( \frac{\sqrt{2}}{\sqrt{2}} \right)^r = \frac{1}{2} = \boxed{\frac{1}{2}}$$



$$\sin^r \alpha = \frac{1}{2} \Rightarrow \sin \alpha = \pm \frac{\sqrt{2}}{2}$$

سوال (۵)

$$r \sin^r \alpha + \cos^r \alpha = \frac{1}{r}$$

$$\sin^r \alpha + \cos^r \alpha = \frac{1}{r}$$

سوال (۶)

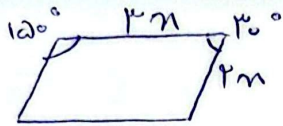
$$\frac{4 \times \sqrt{3}}{4} \times \sin \alpha = \frac{1}{2} \Rightarrow \sin \alpha = \frac{1}{2} = \frac{1}{2 \times \sqrt{3}} = \frac{1}{2\sqrt{3}}$$

$\min \alpha = 4^\circ$   $\max \alpha = 11^\circ$

$\frac{11}{40} = \boxed{1}$

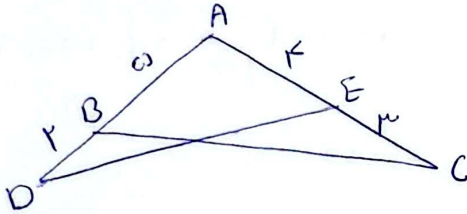






سوال ۷  
 $2m \times 3m \times \sin 120^\circ = 2\sqrt{3} \Rightarrow 1\sqrt{3}$   
 $4m^2 = 1\sqrt{3} \Rightarrow m^2 = 1\sqrt{3} \Rightarrow m = \sqrt{1\sqrt{3}}$

مساحت المثلث =  $2m + 2m + 2m + 2m = 4m = 4\sqrt{1\sqrt{3}} = 4\sqrt{2}$

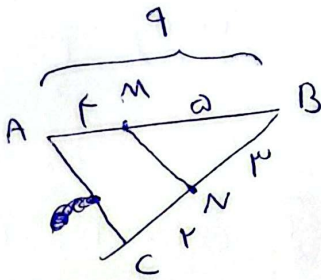


سوال ۸  
 $S_{ABC} = \frac{a \times b \times \sin A}{2}$

$S_{ADE} = \frac{a \times b \times \sin A}{2}$

$S_{ABC} - S_{ADE} = 1\sqrt{2} \sin A - 1\sqrt{2} \sin A = 1\sqrt{2} \sin A$

$\Rightarrow \sin A = \frac{1\sqrt{2}}{1\sqrt{2}} = 1 \Rightarrow A = 90^\circ$



سوال ۹  
 $S_{BMN} = \frac{BM \times NB \times \sin B}{2}$

$S_{ABC} = \frac{BC \times AB \times \sin B}{2} = 1 \times \frac{BM \times NB \times \sin B}{2}$

$\frac{BC \times AB}{2} = 1 \times \frac{BM \times NB}{2} \Rightarrow \Delta AB = 9BM \Rightarrow \frac{BM}{AM} = \frac{a}{c}$

سوال ۱۰  
 $\frac{|\sin \alpha|}{\cos} = -\frac{1}{\cot}$

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

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

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

$\left. \begin{matrix} \sin \alpha < 0 \\ \cos \alpha < 0 \end{matrix} \right\} \Rightarrow \alpha \text{ در ربع دوم}$