۱- [illegible]

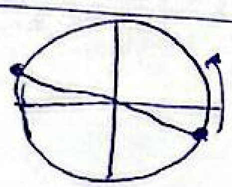
$\cot = \frac{\cos}{|\sin|}$, $\frac{1}{|\cos|} - \frac{\sin}{\cos} = \frac{1-\sin}{|\cos|} \Rightarrow \cos = |\cos| \Rightarrow \cos \oplus$

$\frac{\cos}{\sin} = \frac{\cos}{|\sin|} \Rightarrow \sin = |\sin| \Rightarrow \sin \oplus$

$\sin +$, $\cos +$ ⟹ در ناحیه اول

۲-

$-\frac{\pi}{6} < 2x < \frac{5\pi}{6}$



$\Rightarrow -\frac{1}{2} < \sin 2x \le 1$

$-\frac{1}{2} < \frac{m-1}{4} \le 1 \Rightarrow -1 < m \le 5$

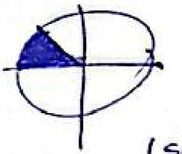
۳-

$\frac{1}{\sin\cos} = -3 \Rightarrow -\frac{1}{3} = \sin\cos$

$\sin^3 + \cos^3 = (\sin + \cos)(\sin^2 + \cos^2 - \sin\cos)$

$(\sin+\cos)\left(1 + \frac{1}{3}\right)$

$\frac{3\pi}{4} < x < \pi$

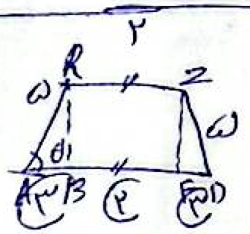


$(\sin+\cos)^2 = 1 - \frac{2}{3} \Rightarrow (\sin+\cos)^2 = \frac{1}{3} \Rightarrow |\sin+\cos| = \sqrt{\frac{1}{3}} = \frac{1}{\sqrt3}$

$\sin^3 + \cos^3 = -\frac{1}{\sqrt3} \times \frac{4}{3} = -\frac{4}{3\sqrt3}$

با توجه به شکل ۱ $\sin + \cos = -\frac{1}{\sqrt3}$

۴-



$5 \times \frac{6}{10} = AB = FD = 3$

$\Rightarrow AD = 8$

$RB = \frac{8}{10} \times 5 = 4$

ارتفاع

مساحت $= \frac{\text{ارتفاع} \times \text{مجموع دو قاعده}}{2} \Rightarrow \frac{10 \times 4}{2} = 20$

۵-

$(-\cot 15 \times \tan 15) - (\sin 105 \times -\sin 15) = \sin^2 15 - 1 = 1 - \cos^2 15 - 1 = -\cos^2 15$

$-1 + \sin^2 15$

$k = -1$

۶-

$\sqrt2 \times -\frac{\sqrt2}{2} \times -\cos 27$ $\quad -\cancel{\sqrt2 \times \frac{\sqrt2}{2}} \times -\cos 27$

$\frac{3}{2} \times \cos 27 + \cos(27) = \frac{5}{2}\cos 27 \Rightarrow$ ۲٫۵ برابر $\cos 27$

سیدعلی [illegible] ۱۲/۲

۷-

$6a = \frac{\pi}{6}$

$12a = \frac{\pi}{3}$

$24a = \frac{2\pi}{3}$

$$\cancel{16}\cos^2(2a) \times \frac{3}{\cancel{4}} \times \frac{1}{\cancel{4}} \times \frac{1}{4} = \frac{3}{4}\cos^2\left(\frac{\pi}{12}\right) =$$

$$\cos^2\alpha = \frac{1+\cos 2\alpha}{2} = \frac{1+\cos\frac{\pi}{6}}{2} = \frac{\frac{\sqrt{3}}{2}+1}{2} =$$

$$\frac{3}{4} \times \frac{(2+\sqrt{3})}{4} = \frac{6+3\sqrt{3}}{16} \qquad \frac{2+\sqrt{3}}{4}$$

۸-

$$4+4\sin = 1-\sin \Rightarrow 5\sin = -3 \Rightarrow \sin = -\frac{3}{5} \Rightarrow \cos = -\frac{4}{5}$$

$$\tan\frac{\alpha}{2} = \frac{\sin\alpha}{1+\cos\alpha} \qquad \frac{-\frac{3}{5}}{1-\frac{4}{5}} = \frac{-\frac{3}{5}}{\frac{1}{5}} = -3$$

۹-

$$\frac{\sin\alpha}{1+\cos\alpha} = \tan\frac{\alpha}{2} \qquad \frac{1+\cos\alpha}{\sin\alpha} = \cot\frac{\alpha}{2}$$

$$\frac{1-\cos}{\sin\alpha} = \tan\frac{\alpha}{2} \Rightarrow \frac{\sin}{1-\cos} = \cot\frac{\alpha}{2} \Rightarrow 2\cot\frac{\alpha}{2} \Rightarrow k = 2$$

۱۰-

(در ناحیه دوم) $\Rightarrow$ $\cos -$, $\sin +$

$$\sin\alpha = \frac{\sqrt{2}}{10} \ (+) \Rightarrow \cos = (-)\frac{\sqrt{96}}{10}$$

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

$$-\frac{\sqrt{2}}{2} \times \cancel{\cos\alpha} - \sin\alpha \times \frac{\sqrt{2}}{2}$$

$$-\frac{\sqrt{96}}{10} \quad - \frac{\sqrt{2}}{10} \times \frac{\sqrt{2}}{2} = \frac{\sqrt{96}\times\sqrt{2}}{20} - \frac{2}{20} = \frac{\sqrt{192}-2}{20} = \frac{8\sqrt{3}-2}{20}$$