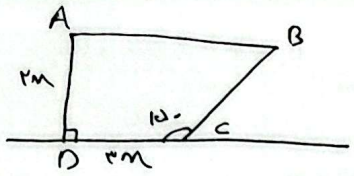
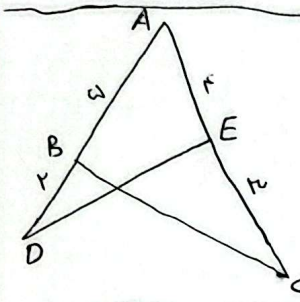


$x \cdot 2m = 24 \longrightarrow 2m^2 = 24 \longrightarrow x = 2\sqrt{2} \longrightarrow (2m+2m)\cdot 2 = 8\sqrt{2}$ ①



②

$3a\sin A - 2A\sin A = 1,1a = 7\sin A \longrightarrow \sin A = \frac{1}{4}$

$\tan A = \sqrt{\frac{\sin^2 A}{1-\sin^2 A}} = \frac{\sqrt{15}}{15}$

③

$\frac{1}{\sqrt{\cos^2\alpha}} - \tan\alpha = \frac{1+\sin\alpha}{|\cos\alpha|}$ $\qquad \frac{|\sin\alpha|}{\cos\alpha} = -\frac{1}{\cot\alpha}$

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

$\frac{|\sin\alpha|}{\cos\alpha} = -\frac{1}{\cot\alpha} \longrightarrow \cot\alpha \longrightarrow \sin\alpha \neq 0$

$\frac{|\sin\alpha|}{\cos\alpha} = -\frac{\sin\alpha}{\cos\alpha} \longrightarrow \sin\alpha < 0$ ناحیه سوم

④

$\tan\alpha = \frac{3}{4} \longrightarrow \tan\left(\frac{\pi}{2}-\alpha\right) = \frac{\sin\left(\frac{\pi}{2}-\alpha\right)}{\cos\left(\frac{\pi}{2}-\alpha\right)} = \frac{\cos\alpha}{\sin\alpha} = \cot\alpha = \frac{4}{3}$

⑤

$\frac{3\cos(240^\circ) - 2\sin(150^\circ)}{\sin(270^\circ) - \cos(180^\circ)} = +\frac{1}{2}$

⑥

$\frac{\sin\left(\frac{\pi}{2}+\alpha\right) - \sin(\alpha-\pi)}{|\tan^2\alpha - 1|} = \frac{\cos\alpha - (-\sin\alpha)}{|\frac{9}{4}-1|} = \frac{\frac{2-\sqrt{5}}{3}}{\frac{1}{4}} = \frac{8-4\sqrt{5}}{3}$

$\cos\alpha = \frac{2}{3}$

⑦

$\sin\alpha = 2\cos\alpha$ $\qquad \sin^2\alpha + \cos^2\alpha = 1 \longrightarrow 4\cos^2\alpha + \cos^2\alpha = 1$

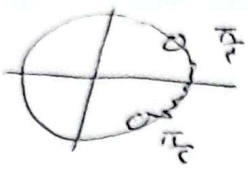
$|\cos\alpha| = \frac{\sqrt{5}}{5}$ $\qquad \cos\alpha = -\frac{\sqrt{5}}{5}$ ناحیه سوم

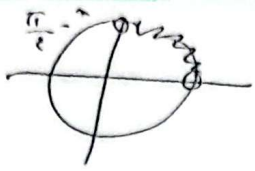
⑧

$\frac{-2m}{m^2-1} = \tan 60 \longrightarrow \sqrt{3}m^2 + 2m - \sqrt{3} = 0$

$\frac{-2 \pm 4}{2\sqrt{3}} = m \longrightarrow m = \frac{1}{\sqrt{3}}$ $\qquad -\sqrt{3}$

(9)





$\alpha < \tan\left(\frac{\pi}{2} - m\right)$

$\frac{1-m}{1+m} > 0 \longrightarrow m \in (-1, -1)$

(10)

$\tan(120) \times \sin(120) - \cot(120) \times -\cos(60)$

$\frac{\cos^2 60}{\sin 60} + \frac{\sin^2 120}{\cos 120} = 2\left(\frac{1}{2} + \frac{3}{2}\right) = (2)$