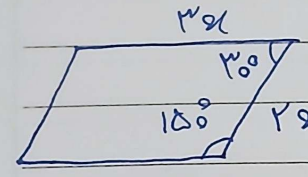
1

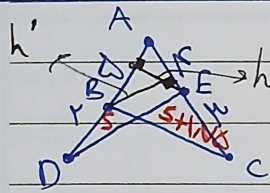


$S = 24 \rightsquigarrow \Delta\epsilon = 2x \times 3x \times \sin 30 \perp \sin 150$

$24 = 3x^2 \times \frac{1}{2} \rightarrow x^2 = 16 \rightarrow x = 4\sqrt{2}$

$4p = 10x = 40\sqrt{2}$

2



$\frac{h}{4} = 2\sin\hat{A}$

$\frac{h'}{5} = 2\sin\hat{A}$

$h' = 5\sin\hat{A}$

$\tan\hat{A} = ?$

$S_{AED} + 1/75 = S_{ABC}$

$\frac{4\sin\hat{A} \times 7}{2} + 1/75 = \frac{5\sin\hat{A} \times 7}{2}$

$1/75 = \frac{35\sin\hat{A} - 28\sin\hat{A}}{2}$

$1/75 = \frac{7}{2}\sin\hat{A} \rightarrow \frac{1}{4} = \sin\hat{A}$

$\cos\hat{A} > 0, \cos\hat{A} = \frac{\sqrt{15}}{4} \rightarrow \tan\hat{A} = \frac{1}{\sqrt{15}} = \frac{\sqrt{15}}{15}$

3

$\frac{|\sin\alpha|}{\cos\alpha} = -\frac{1}{\cot\alpha} \rightsquigarrow \frac{|\sin\alpha|}{\cos\alpha} = -\frac{\sin\alpha}{\cos\alpha} \rightsquigarrow \sin\alpha < 0$

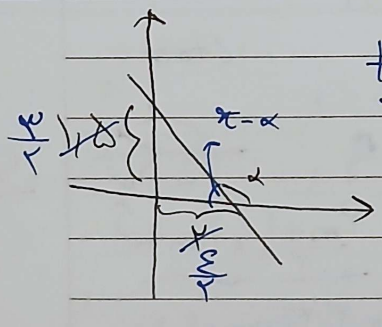
$\frac{1}{\cos^2\alpha} - \tan\alpha = \frac{1 + \sin\alpha}{|\cos\alpha|} \rightsquigarrow \frac{1}{|\cos\alpha|} - \frac{\sin\alpha}{\cos\alpha} = \frac{1 + \sin\alpha}{|\cos\alpha|}$

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

α در ناحیه ۳ قرار دارد

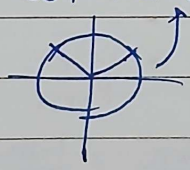
α در کدام ناحیه؟

4



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

$\cot\alpha = -\cot(\pi - \alpha)$



$\cot\alpha = -\frac{\pi}{3}$

5

$$\frac{3\cos\left(3\frac{\pi}{2} - 22\right) - 2\sin(\pi - 22)}{\sin(\pi + 22) - \cos\left(3\frac{\pi}{2} + 22\right)}$$

$-\sin(22)$

$$\hookrightarrow \frac{-3\sin(22) - 2\sin(22)}{-\sin(22) - \sin(22)} = \frac{5}{2}$$

$-2\sin(22)$

$$\frac{\sin(\frac{\pi}{2}+\alpha)-\sin(\alpha-\pi)}{|\tan^2\alpha-1|}$$

$\sin(\pi-\alpha)$

$\tan^2\alpha - 1 = \frac{1}{\cos^2} - 1$

$\cos\alpha = \frac{2}{3}$, α ↳ در ناحیه چهارم, $\sin\alpha < 0$

↳ $\cos^2\alpha+\sin^2\alpha = 1$ → $\frac{4}{9}+\sin^2\alpha = 1$, $\sin\alpha = -\frac{\sqrt{5}}{3}$

↳ $\frac{\cos\alpha+\sin\alpha}{|\frac{1}{\cos^2}-2|}$, $\sin\alpha = -\frac{\sqrt5}{3}$ ↳ $\frac{9}{4}-2 = \frac{1}{4}$

$\frac{\frac{2-\sqrt5}{3}}{\frac{1}{4}}$ → $\frac{8-4\sqrt5}{3}$

6

$\sin\alpha = 2\cos\alpha$

α → در ناحیه سوم ↳ $\cos\alpha<0$, $\sin\alpha<0$

$\cos\alpha = ?$

↳ $\sin^2\alpha + \cos^2\alpha = 1$, $4\cos^2\alpha$ → $\cos^2\alpha = \frac{1}{5}$ → $\cos\alpha = -\frac{\sqrt5}{5}$

$\sin\alpha = -\frac{2\sqrt5}{5}$

7

$2mx+(m^2-1)y=3$

$\tan\alpha = \sqrt3$

↳ $-2mx+3 = (m^2-1)y$

$\frac{-2m}{m^2-1}x$

↳ $\frac{-2m}{m^2-1} = \sqrt3$ } $-2m = \sqrt3 m^2 - \sqrt3$ ↳ $\sqrt3 m^2 + 2m - \sqrt3$

$m = \frac{-2\pm4}{2\sqrt3}$ → $\frac{-6}{2\sqrt3} = -\sqrt3$; ↳ $\frac{2}{2\sqrt3} = \frac{\sqrt3}{3}$

$-\frac{2\sqrt3}{3}$

8

$\tan(\frac{\pi}{4}-x) = \frac{1-m}{2+m}$

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

↳ $\frac{\tan\frac{\pi}{4}-\tan x}{1+\tan\frac{\pi}{4}\tan x}$ → $\frac{1-\tan x}{1+\tan x} = \frac{1-m}{2+m}$

↳ ترکیب در مخرج ↳ $\frac{1-\tan x}{2} = \frac{1-m}{3}$ → $3-3\tan x = 2-2m$

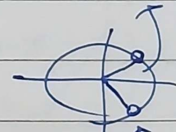
$\frac{2m+1}{3} = \tan x$

$-1<\tan x<1$

$-3<2m+1<3$ } $-1<\frac{2m+1}{3}<1$

$-4<2m<2$

$-2<m<1$



9

$\tan(300^\circ)\cos(210^\circ)+\tan(480^\circ)\sin(140^\circ)$

$-\sqrt3 \quad -\frac{\sqrt3}{2}$; $\tan 120 \quad \sin 120$

$\frac{3}{2}$; $-\sqrt3\times\frac{\sqrt3}{2}$ → $-\frac{3}{2}$ ↳ 0

10