فرانک آقایی — تکلیف شماره ی ۲۷ — یازدهم دختر C

1.

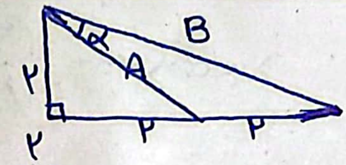
$$\frac{1}{\cancel{2}}\times\sqrt{3}\times\cancel{6}^{\,3}\times\sin\alpha=\cancel{4/5}^{\,1/5}$$

$$\sin\alpha=\frac{1/5\sqrt{3}}{\frac{3}{2}}\longrightarrow\alpha=60,\ 120$$

$$\frac{120}{60}=2$$

2.

$$\cot\alpha=\frac{\cos\alpha}{\sin\alpha}$$



راه ۲ $\longrightarrow$ S کل $=\frac{2\times4}{2}=4-\frac{\cancel{2\times2}}{\cancel{2}}=2\longrightarrow\frac{1}{\cancel{2}}\sin\alpha\times\cancel{A}^{\,2\sqrt{2}}\times\cancel{B}_{\,2\sqrt{5}}=\cancel{2}$

$$A=\sqrt{4+4}=2\sqrt{2}$$

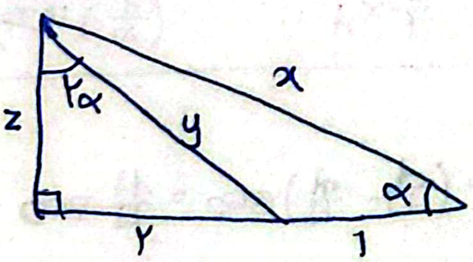
$$B=\sqrt{(4)^2+(2)^2}=\sqrt{20}=2\sqrt{5}$$

$$\sqrt{10}\times\sin\alpha=1\longrightarrow\sin=\frac{1}{\sqrt{10}}$$

$$\sin^2x+\cos^2x=1\longrightarrow\frac{1}{10}+\frac{9}{10}=1\longrightarrow\cos x=\sqrt{\frac{9}{10}}\longrightarrow\cot\alpha=\frac{\sqrt{\frac{9}{10}}}{\sqrt{\frac{1}{10}}}=3$$

3.

$$\cos2x=\cos^2x-\sin^2x \qquad \sin2x=2\sin x\cos x$$



$$\frac{z}{y}=\left(\frac{3}{x}\right)^2-\left(\frac{z}{x}\right)^2\longrightarrow\frac{9-z^2}{x^2}=\frac{z}{y}$$

$$\frac{2}{y}=2\times\frac{z}{x}\times\frac{3}{x}\longrightarrow x^2=3zy\longrightarrow\frac{9-z^2}{3z\cancel{y}}=\frac{z}{\cancel{y}}$$

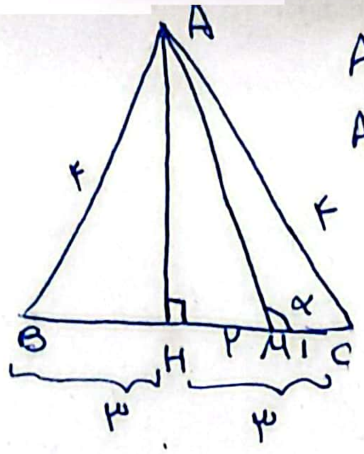
$$9-z^2=3z^2$$

$$9=4z^2\longrightarrow z=\frac{3}{2}$$

$$\cot\alpha=\frac{3}{z}=2$$

CamScanner

.4



$AH = \sqrt{7}$

$AM = \sqrt{11}$

$$\sqrt{a^2+b^2-2ab\cos\alpha} \longrightarrow \sqrt{11+1-2\sqrt{11}\cos\alpha} \longrightarrow \cos\alpha = \frac{2\sqrt{11}}{11}$$

$$1+\tan^2\alpha = \frac{1}{\cos^2\alpha} \longrightarrow \tan\alpha = \frac{\sqrt{7}}{2} \xrightarrow[\text{شیب } \ominus]{\text{زاویه باز}} -\frac{\sqrt{7}}{2}$$

$$2\sin^2 x+\cos^2 x = \frac{4}{3} \longrightarrow \sin^2 x+\overbrace{\sin^2 x+\cos^2 x}^{1} = \frac{4}{3} \longrightarrow \sin^2 x = \frac{1}{3}$$ .5

$$\sin x = \frac{\sqrt{3}}{3}$$

$$\sin^2 x+\cos^2 x = 1 \longrightarrow \frac{1}{3}+\frac{2}{3} = 1 \longrightarrow \cos x = \sqrt{\frac{2}{3}}$$

$$\tan x = \frac{\sqrt{\frac{1}{3}}}{\sqrt{\frac{2}{3}}} = \sqrt{\frac{1}{2}} = \frac{\sqrt{2}}{2} \longrightarrow \tan^2 x = \frac{1}{2}$$

.6

$$\sin^4 x = (\sin^2 x)^2 = (1-\cos^2 x)^2 = 1-2\cos^2 x+\cos^4 x \xrightarrow{+4\cos^2 x} \sin^4 x+4\cos^2 x = 1+2\cos^2 x+\cos^4 x \longrightarrow$$

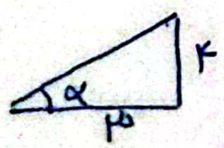
$$\sin^4 x+4\cos^2 x = (1+\cos^2 x)^2$$

$$\cos^4 x = (\cos^2 x)^2 = (1-\sin^2 x)^2 = 1-2\sin^2 x+\sin^4 x \xrightarrow{+4\sin^2 x} \sin^4 x+4\sin^2 x+1 = (1+\sin^2 x)^2$$

$$\frac{(\cos^2 x+1)^2}{1+\cos^2 x} - \frac{(\sin^2 x+1)^2}{\sin^2 x+1} = \cos^2 x+1-1-\sin^2 x = \cos 2x$$

$$\underbrace{\sin\left(\frac{\pi}{2}+\alpha\right)}_{-\cos\alpha} \underbrace{\cos\left(3\pi+\frac{\pi}{2}-\alpha\right)}_{+\sin\alpha} - \underbrace{\tan\left(\alpha-\frac{3\pi}{2}\right)}_{-\cot\alpha} = -\cos\alpha\cancel{\sin\alpha} + \cancel{\cot\alpha}$$ .7

$$\frac{\cos\alpha}{\cancel{\sin\alpha}}$$



$$\sin x = \frac{4}{5}$$

$$\cos\alpha = \frac{3}{5} \qquad -\frac{12}{25}+\frac{3}{4} = \frac{27}{100}$$

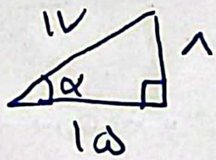
8.

$$\left(3\cos\frac{5\pi}{12}+\sqrt{2}\sin\frac{\pi}{12}-\cos\frac{\pi}{12}\right)=$$

$$\underbrace{\sqrt{2}(\sin x-\cos x)}_{\sqrt{2}\sin(x-\frac{\pi}{4})}=2\sin\left(\frac{\pi}{12}-\frac{\pi}{4}\right)=-1\Big\}\ \frac{3}{2}-1=\frac{1}{2}$$

9.

$$\frac{2\tan(\frac{\alpha}{2})}{1-\tan^2(\frac{\alpha}{2})}=\frac{2\times\frac{1}{4}}{1-\frac{1}{16}}=\frac{\frac{1}{2}}{\frac{15}{16}}=\frac{8}{15}=\tan\alpha$$



$$\frac{\frac{8}{15}-\frac{80}{17}}{\frac{8}{17}-\frac{15}{17}}=\frac{\frac{136-120}{\cancel{17}\times15}}{\frac{-7}{\cancel{17}}}=\frac{\frac{16}{15}}{-7}=-\frac{16}{105}$$

10.

$$2\sin\alpha<\sin2\alpha$$

$$\Downarrow$$

$$2\sin\alpha<2\sin\alpha\cos\alpha$$

$$0<\underbrace{2\sin\alpha}_{\ominus}\underbrace{(\cos\alpha-1)}_{\ominus}$$

$$0<\frac{\frac{\cos\alpha}{\sin\alpha}}{\sin\alpha}\longrightarrow 0<\frac{\cos\alpha}{\underset{+}{\sin^2\alpha}}\longrightarrow 0<\cos\alpha$$

در ربع چهارم است