فرانک آقایی ۲۰ تکلیف شماره ی ۲۷ یازدهم دختر C

.1

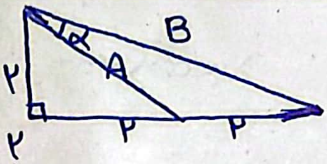
$$\frac{۱}{\cancel{۲}} \times \sqrt{۳} \times \overset{۳}{\cancel{۶}} \times \sin\alpha = \overset{۱/۵}{\cancel{۴/۵}} =$$

$$\sin\alpha = \frac{۱/۵\sqrt{۳}}{\frac{۳}{۲}} \rightarrow \alpha = ۶۰ , ۱۲۰$$

$$\frac{۱۲۰}{۶۰} = ۲$$

.2

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



$$راه ۲ \rightarrow S\ کل = \frac{۲\times۴}{۲} = ۴ - \frac{\cancel{۲}\times\cancel{۲}}{\cancel{۲}} = ۲ \rightarrow \frac{۱}{\cancel{۲}} \sin\alpha \times \overset{۲\sqrt{۲}}{\cancel{A}} \times \underset{۲\sqrt{۵}}{\cancel{B}} = \cancel{۲}$$

$$A = \sqrt{۴+۴} = ۲\sqrt{۲}$$

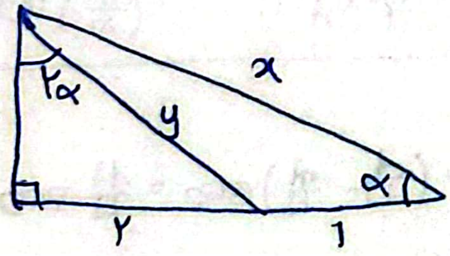
$$B = \sqrt{(۴)^۲ + (۲)^۲} = \sqrt{۲۰} = ۲\sqrt{۵}$$

$$\sqrt{۱۰} \times \sin\alpha = ۱ \rightarrow \sin = \frac{۱}{\sqrt{۱۰}}$$

$$\sin^۲ x + \cos^۲ x = ۱ \longrightarrow \frac{۱}{۱۰} + \frac{۹}{۱۰} = ۱ \rightarrow \cos x = \sqrt{\frac{۹}{۱۰}} \rightarrow \cot\alpha = \frac{\sqrt{\frac{۹}{۱۰}}}{\sqrt{\frac{۱}{۱۰}}} = ۳$$

.3

$$\sin ۲x = ۲\sin x\cos x \qquad \cos ۲x = \cos^۲ x - \sin^۲ x$$



$$\frac{z}{y} = \left(\frac{۳}{x}\right)^۲ - \left(\frac{z}{x}\right)^۲ \rightarrow \frac{۹-z^۲}{x^۲} = \frac{z}{y}$$

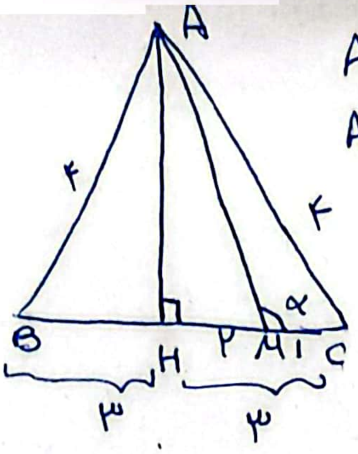
$$\frac{\cancel{۲}}{y} = \cancel{۲}\times\frac{z}{x}\times\frac{۳}{x} \rightarrow x^۲ = ۳zy \rightarrow \frac{۹-z^۲}{۳z\cancel{y}} = \frac{z}{\cancel{y}}$$

$$۹-z^۲ = ۳z^۲$$

$$۹ = ۴z^۲ \rightarrow z = \frac{۳}{۲}$$

$$\cot\alpha = \frac{۳}{z} = ۲$$

.4



$AH=\sqrt{۷}$

$AM=\sqrt{۱۱}$

$$\sqrt{a^۲+b^۲-۲ab\cos\alpha} \longrightarrow \sqrt{۱۱+۱-۲\sqrt{۱۱}\cos\alpha} \to \cos\alpha=\frac{۲\sqrt{۱۱}}{۱۱}$$

$$1+\tan^۲\alpha=\frac{۱}{\cos^۲\alpha} \longrightarrow \tan\alpha=\frac{\sqrt{۷}}{۲}$$ → زاویه‌ی باز → $-\frac{\sqrt{۷}}{۲}$

شیب ⊖

$$۲\sin^۲x+\cos^۲x=\frac{۴}{۳} \to \sin^۲x+\overbrace{\sin^۲x+\cos^۲x}^{۱}=\frac{۴}{۳} \longrightarrow \sin^۲x=\frac{۱}{۳}$$ .5

$$\downarrow$$

$$\sin x=\frac{\sqrt{۳}}{۳}$$

$$\sin^۲x+\cos^۲x=۱ \longrightarrow \frac{۱}{۳}+\frac{۲}{۳}=۱ \to \cos x=\sqrt{\frac{۲}{۳}}$$

$$\tan x=\frac{\sqrt{\frac{۱}{۳}}}{\sqrt{\frac{۲}{۳}}}=\sqrt{\frac{۱}{۲}}=\frac{\sqrt{۲}}{۲} \longrightarrow \tan^۲x=\frac{۱}{۲}$$

.6

$$\sin^۴x=(\sin^۲x)^۲=(۱-\cos^۲x)^۲=۱-۲\cos^۲x+\cos^۴x \xrightarrow{+۴\cos^۲x} \sin^۴x+۴\cos^۲x=۱+۲\cos^۲x+\cos^۴x$$

$$\sin^۴x+۴\cos^۲x=(۱+\cos^۲x)^۲$$

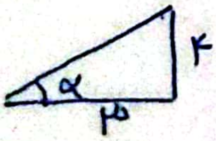
$$\cos^۴x \to$$

$$\cos^۴x=(\cos^۲x)^۲=(۱-\sin^۲x)^۲=۱-۲\sin^۲x+\sin^۴x \xrightarrow{+۴\sin^۲x} \sin^۴x+۴\sin^۲x+۱=(۱+\sin^۲x)^۲$$

$$\frac{(\cos^۲x+۱)^۲}{۱+\cos^۲x}-\frac{(\sin^۲x+۱)^۲}{\sin^۲x+۱}=\cos^۲x+۱-۱-\sin^۲x=\cos ۲x$$

$$\underbrace{\sin(\frac{\pi}{۲}+\alpha)}_{-\cos\alpha}\ \underbrace{\cos(۳\pi+\frac{\pi}{۲}-\alpha)}_{+\sin\alpha}-\underbrace{\tan(\alpha-\frac{۳\pi}{۲})}_{-\cot\alpha}=-\cos\alpha\,\cancel{\sin\alpha}+co\cancel{t\alpha}$$ .7

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



$$\sin x=\frac{۴}{۵}$$

$$\cos\alpha=\frac{۳}{۵} \qquad \frac{-۱۲}{۲۵}+\frac{۳}{۴}=\frac{۲۷}{۱۰۰}$$

.8

$$\left(۳\cos\frac{۴\pi}{۱۲}+\sqrt{۲}\sin\frac{\pi}{۱۲}-\cos\frac{\pi}{۱۲}\right)=$$ [redacted]

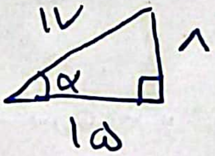
$$\sqrt{۲}(\underbrace{\sin\alpha-\cos\alpha}_{\sqrt{۲}\sin(\alpha-\frac{\pi}{۴})})=۲\sin\left(\frac{\pi}{۱۲}-\frac{\pi}{۴}\right)=-۱\Big\}\ \frac{۳}{۲}-۱=\frac{۱}{۲}$$

[redacted]

د

.9

$$\frac{۲\tan(\frac{\alpha}{۲})}{۱-\tan^{۲}(\frac{\alpha}{۲})}=\frac{۲\times\frac{۱}{۴}}{۱-\frac{۱}{۱۶}}=\frac{\frac{۱}{۲}}{\frac{۱۵}{۱۶}}=\frac{۸}{۱۵}=\tan\alpha$$



$$\frac{\frac{۸}{۱۵}-\frac{۸}{۱۷}}{\frac{۸}{۱۷}-\frac{۱۵}{۱۷}}=\frac{\frac{\overset{۱۳۶}{\text{[redacted]}}-۱۲۰}{\cancel{۱۷}\times۱۵}}{\frac{-۷}{\cancel{۱۷}}}=\frac{\frac{۱۶}{۱۵}}{-۷}=-\frac{۱۶}{\overset{\text{[redacted]}}{۱۰۵}}$$

د

. 10

$$۲\sin\alpha<\sin ۲\alpha$$

$$\downarrow$$

$$۲\sin\alpha<۲\sin\alpha\cos\alpha$$

$$۰<\underbrace{۲\sin\alpha}_{\ominus}(\underbrace{\cos\alpha-۱}_{\ominus})$$

د

$$۰<\frac{\frac{\cos\alpha}{\sin\alpha}}{\sin\alpha}\longrightarrow ۰<\frac{\cos\alpha}{\underset{+}{\boxed{\sin^{۲}\alpha}}}\longrightarrow ۰<\cos\alpha$$

د ربع چهارم است