October 27, 2010

Note Title 10/27/2010

Questions:

§6.2 #39 want $\tan 30°$?

know $\tan\theta = \dfrac{\sin\theta}{\cos\theta}$.

So $\tan 30° = \dfrac{\sin 30°}{\cos 30°}$

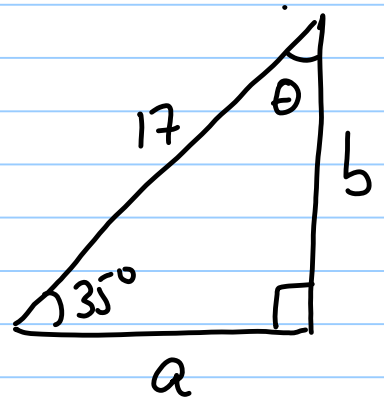
$= \dfrac{1/2}{\sqrt{3}/2} = \dfrac{1}{\sqrt{3}} = \dfrac{\sqrt{3}}{3}$

6.3 Applications

Number	Significant digits
0.0002	1 significant digit
0.145	3
0.0145	3
0.1045	4
2.13	3
19	2
19.00	4

19.000 5

Example Given angle & a side



Step 1: Determine accuracy

2 Sig. digits

Step 2: Solve for θ.

$$\theta + 35^\circ + 90^\circ = 180^\circ$$

$$\theta = 180^\circ - 125^\circ$$

$$= 55^\circ$$

Step 3: Solve for a.

$$\cos 35^\circ = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\cos 35^\circ = \frac{a}{17}$$

$$a = 17 \cos 35^\circ$$

$$\approx 13.92558475$$

$$\approx 14 \quad \text{Round to 2 significant digits}$$

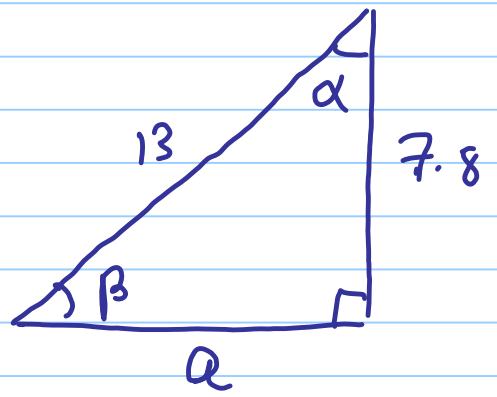
Solve for b:

$$\sin 35^\circ = \frac{b}{17}$$

$$b = 17 \sin(35^\circ) \approx 9.750799418$$

$$\approx 9.8 \quad \text{2 sig. fig}$$

Example Given two sides.



Step 1: Accuracy

2 significant digits

Step 2: Solve for a

$$a^2 + 5^2 = c^2$$

$$a^2 + (7.8)^2 = 13^2$$

$$a^2 = 169 - 60.84$$

$$= 108.16$$

$$\Rightarrow a = \sqrt{108.16}$$

$$\approx 10.4$$

$$\approx 10 \quad (2 \text{ sig. fig})$$

Solve for α:

$$\cos\alpha = \frac{7.8}{13} \quad \frac{\text{adj}}{\text{hyp}}$$

$$\cos\alpha = 0.6$$

$$\alpha = \cos^{-1}(0.6)$$

$$\approx 53.13010^\circ$$

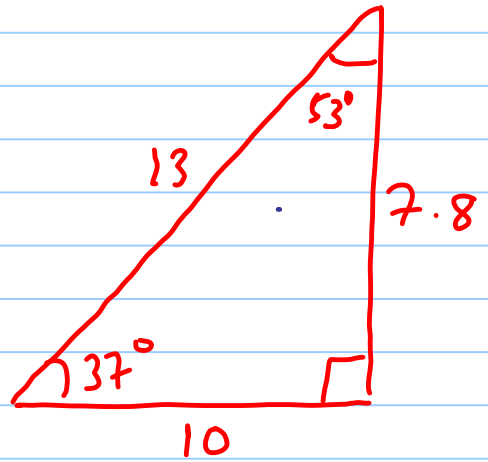
$\boxed{\alpha \approx 53^\circ}$ 2 sig. fig

Solve for β:

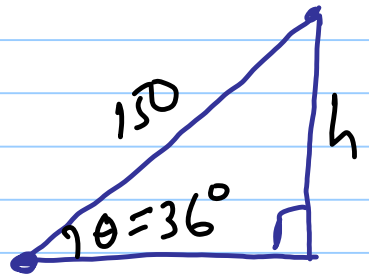
$$\alpha + \beta = 90^\circ$$

$$53^\circ + \beta = 90^\circ$$

$$\boxed{\beta = 37^\circ}$$



Refueling planes



Find h.

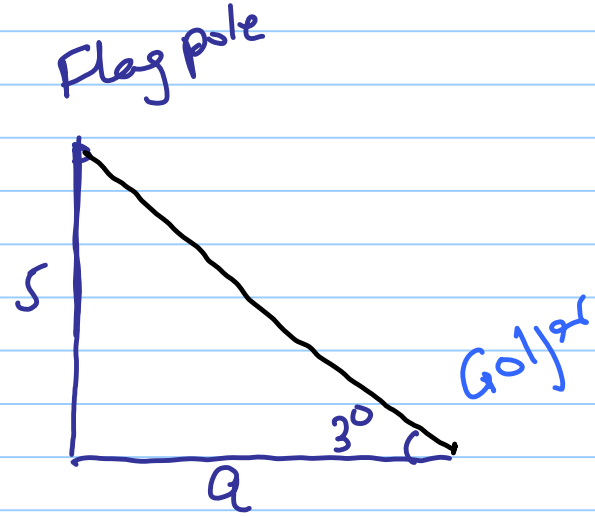
$$\sin 36^\circ = \frac{\text{opp}}{\text{hyp}}$$

$$\sin 36^\circ = \frac{h}{150}$$

$$h = 150 \sin 36^\circ$$

$$\approx 88 \text{ feet}$$

Example



$$\tan 3^\circ = \frac{5}{a}$$

$$a = \frac{5}{\tan 3^\circ}$$

$$\approx 95.40568$$

$$\approx 95 \text{ feet}.$$