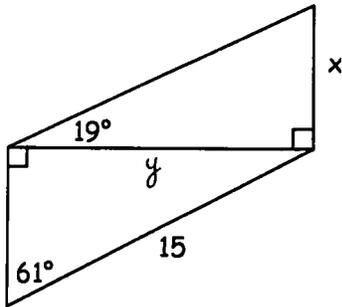


Multi-Triangle Trigonometry

Ex/ Solve for x.



* Find the shared side first

$$\sin 61 = \frac{y}{15}$$

cross multiply

$$15 \sin 61 = y$$

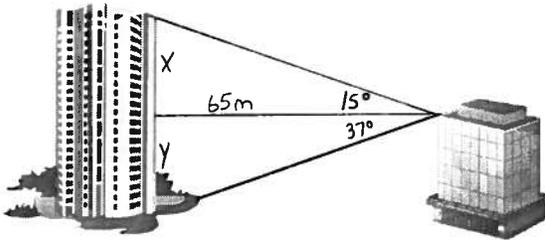
$$y = 13.12$$

$$\tan 19 = \frac{x}{13.12}$$

$$x = 13.12 \tan 19$$

$$= 4.52$$

Ex/ From the roof of a small building, the angle of elevation to the roof of a nearby building is 15° . The angle of depression to the base of the same nearby building is 37° . If the buildings are 65 m apart, how tall are the buildings?



* Make 2 right-angled triangles

$$\tan 15 = \frac{x}{65}$$

$$x = 65 \tan 15$$

$$= 17.42$$

$$\tan 37 = \frac{y}{65}$$

$$y = 65 \tan 37$$

$$= 48.98$$

$$\therefore \text{Tall building} = 17.42 + 48.98$$

$$= 66.4\text{m}$$

$$\therefore \text{Short is } 48.98\text{m}$$

Ex/ A tree is growing on top of a cliff. From a point 18 m away from the bottom of the cliff, the angle of elevation to the top of the tree is 18° , and the angle of elevation to the top of the cliff is 16° . How tall is:

- The cliff
- The tree

$$\text{a) } \tan 16 = \frac{x}{18}$$

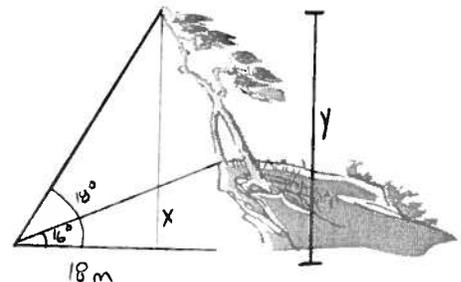
$$x = 18 \tan 16$$

$$= 5.16$$

$$\text{b) } \tan 18 = \frac{y}{18}$$

$$y = 18 \tan 18$$

$$= 5.85$$



$$\text{Tree} = 5.85 - 5.16$$

$$= 0.69\text{m}$$

Homework: Handout - Multi-Triangle Trig