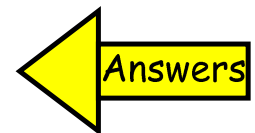
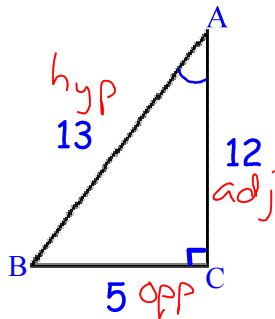


Quiz Time

1. State the primary trig ratios for Angle A



$$\sin A = \frac{5}{13}$$

$$\cos A = \frac{12}{13}$$

$$\tan A = \frac{5}{12}$$

2.a) Find the ratio $\sin 37^\circ = 0.6018$

b) Find the angle: $\cos B = 0.2588$

$$B = \cos^{-1}(0.2588)$$

$$= 75^\circ$$

4.2 Solving Right Triangle Problems

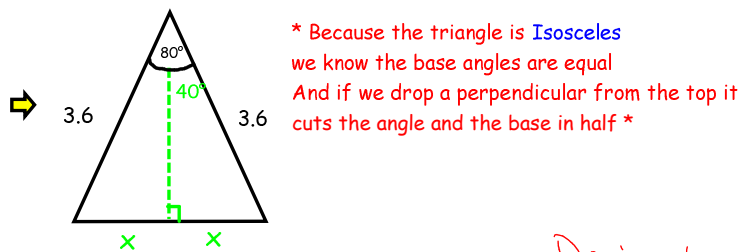
Ex 1:

A triangle garden has two equal sides 3.6 m long and the contained angle of 80° .

(note the angle being held between the two given sides is called a contained angle)

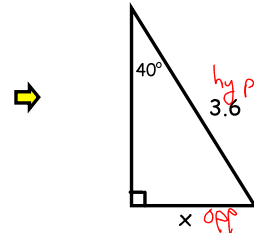
- a) How much edging is needed for the garden?
- b) How much area does this garden cover?

Picture it:



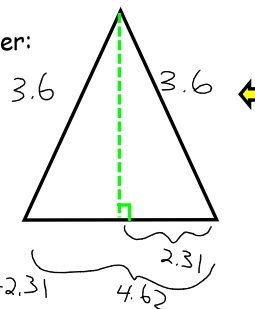
a) Amount of edging - this means I need the Perimeter

Lets look at half the triangle



$$\begin{aligned} \therefore \sin 40^\circ &= \frac{x}{3.6} \\ x &= 3.6 \sin 40^\circ \\ &= 2.31 \end{aligned}$$

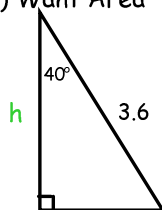
Perimeter:



$$\begin{aligned} p &= 3.6 + 3.6 + 2.31 + 2.31 \\ &= 11.82 \end{aligned}$$

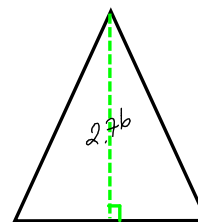
\therefore I will need approx 11,82 m of edging

b) Want Area $A = \frac{bh}{2}$ so I need the base and the height



$$\begin{aligned} \cos 40^\circ &= \frac{h}{3.6} \\ h &= 3.6 \cos 40^\circ \\ &= 2.76 \end{aligned}$$

Area:

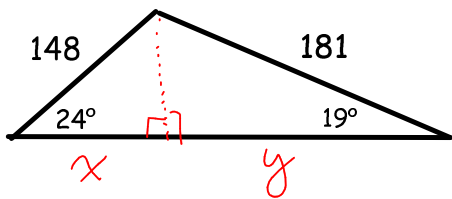


$$\begin{aligned} \text{Area} &= \frac{\text{base} \times \text{height}}{2} \\ &= \frac{4.62 \times 2.76}{2} \\ &= 6.38 \end{aligned}$$

\therefore The area is approx. 6.38 m²

Ex 2:

a) How could Steven determine the unknown side of the triangle below?



Not Isosceles so dropping a perpendicular will not cut base in half - use two different variables



b) Find the length of the unknown side.

Right now we are only using Primary Ratios, after we can use Sin Law?



$$\cos 24^\circ = \frac{x}{148}$$

$$148 \cos 24^\circ = x$$

$$x = 135.20$$

$$\cos 19^\circ = \frac{y}{181}$$

$$181 \cos 19^\circ = y$$

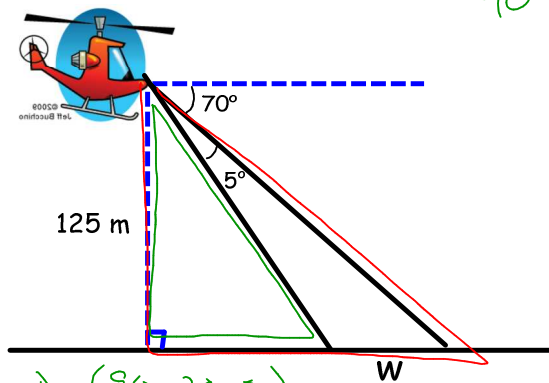
$$y = 171.14$$

Unknown side
 $= 135.2 + 171.14$
 $= 306.34 \text{ units}$

Ex 3:

A searchlight is mounted at the front of a helicopter flying 125 m above ground. The angle of depression the light beam is 70° . An observer on the ground notices that the beam of light measures 5° . How wide is the spot on the ground?

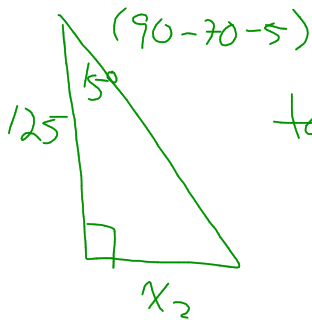
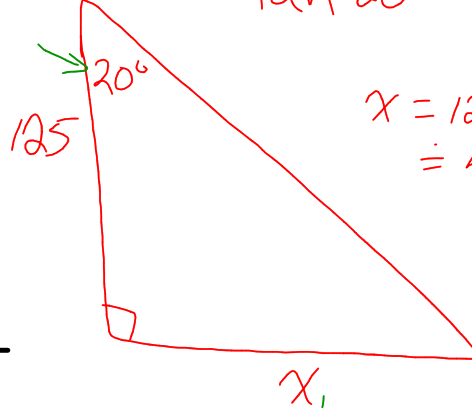
Picture it:



$90 - 70^\circ$

$\tan 20^\circ = \frac{x}{125}$

$x = 125 \tan 20^\circ$
 $= 45.50$



$\tan 15^\circ = \frac{x}{125}$

$x_2 = 125 \tan 15^\circ$
 $= 33.49$

$w = x_1 - x_2$
 $= 45.5 - 33.49$
 $= 12.01$

\therefore The spotlight is approx 12.01 m wide

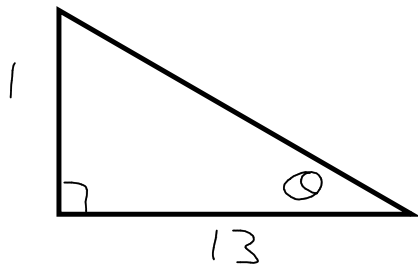
Ex 4

A wheelchair ramp is safe to use if it has a minimum slope of $1/13$ and a maximum slope of $1/4$. What are the minimum and maximum angles of elevation to the top of such a ramp?

$$\frac{1}{13}$$

$$\begin{array}{l} \text{rise} = 1 \\ \text{run} = 13 \end{array}$$

$$\text{slope} = \frac{\text{rise}}{\text{run}}$$

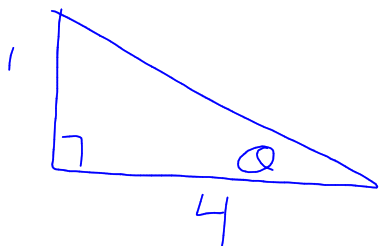


$$\tan \theta = \frac{1}{13}$$

$$\theta = \tan^{-1}\left(\frac{1}{13}\right)$$

$$\approx 4^\circ$$

$$\frac{1}{4}$$



$$\tan \theta = \frac{1}{4}$$

$$\theta = \tan^{-1}\left(\frac{1}{4}\right)$$

$$\approx 14^\circ$$

∴ Minimum slope of 4°
Maximum slope of 14°

Hmwk: p 280 # 1, 2, 4, 9,
13, 14, 16

