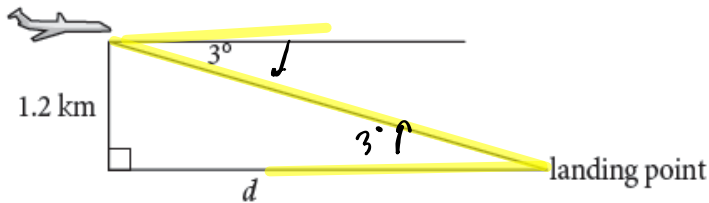


WARM UP...

- 1) A Bombardier CRJ700 passenger airplane flying at an altitude of 1.2 km starts its final airport approach by descending at an angle of depression of 3° . How far along the ground is the airplane from its landing point?
 Answer to the nearest kilometre.

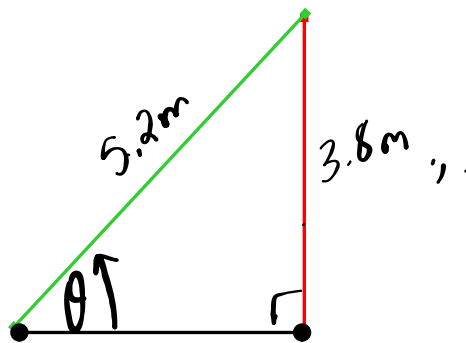


$$\tan 3^\circ = \frac{1.2}{d}$$

$$d = \frac{1.2}{\tan 3^\circ}$$

$$d = 22.5 \text{ km}$$

- 2) At what angle of elevation must a 5.2 m ladder be placed to reach a vertical height of 3.8 m on a wall? Give your answer correct to the nearest degree.

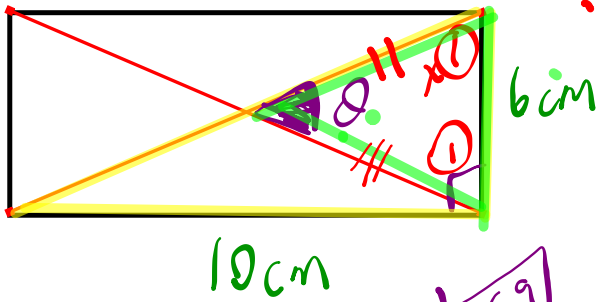


$$\sin^{-1} \left(\frac{3.8}{5.2} \right) = \theta$$

$$\theta = 47^\circ$$

HW??!

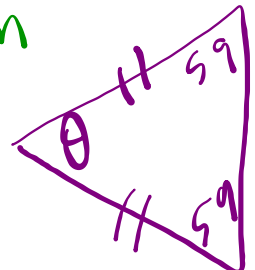
7. A rectangle has length 10 cm and width 6 cm. Find the acute angle to the nearest degree between the diagonals.



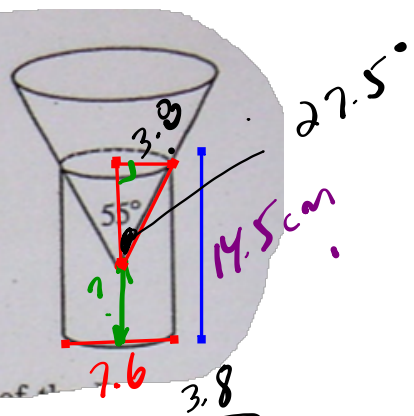
$\tan x = \frac{10}{6}$

$x = 59^\circ$

$\theta = 62^\circ$



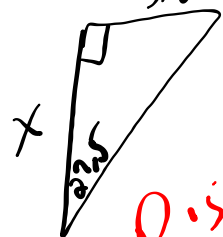
9. A funnel is placed in a glass, as shown. If the glass is 14.5 cm tall and 7.6 cm in diameter, how high is the vertex of the funnel above the bottom of the glass?



$\tan 27.5^\circ = \frac{3.8}{x}$

$x = \frac{3.8}{\tan 27.5}$

$x = 7.3$



Distance = $14.5 - 7.3 = 7.2$

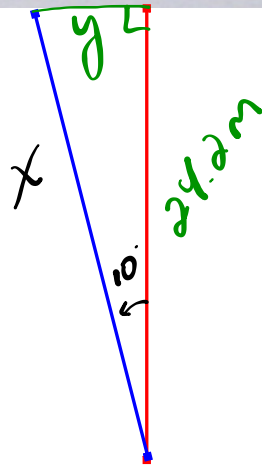
10. Prior to 1982, visitors to the observation deck of the Peace Tower in Ottawa had to ride two elevators. The Memorial Chamber at the base of the tower made a vertical ascent impossible. A new elevator system carries visitors up the first 24.2 m by travelling a path inclined at 10° to the vertical. It then rises vertically for the balance of the trip.

a) How long is the elevator shaft that runs on the incline?
 b) By how far is the elevator displaced horizontally by the incline?
 c) What is the slope of the incline to 2 decimal places?

(24.2) a) (24.2)

b) $\tan 10^\circ = \frac{y}{24.2}$

$4.3 \text{ m} = y$



$\cos 10^\circ = \frac{24.2}{x}$

$x = \frac{24.2}{\cos 10^\circ}$

$x = 24.6 \text{ m}$

c) $m = \frac{\text{Rise}}{\text{Run}}$

$m = \frac{24.2}{4.3}$

$m = 5.67$

Example 1

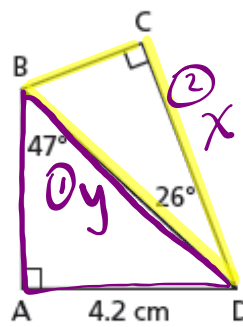
Calculating a Side Length Using More than One Triangle

Calculate the length of CD to the nearest tenth of a centimetre.



SOLUTION

(erase to reveal)



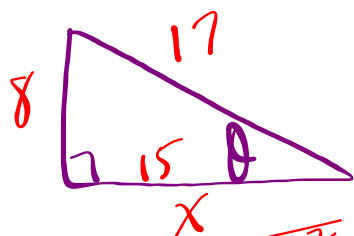
CHECK YOUR UNDERSTANDING



#3. $\sin \theta = \frac{8 \text{ opp}}{17 \text{ hyp}}$

$$\cos \theta = \frac{15}{17}$$

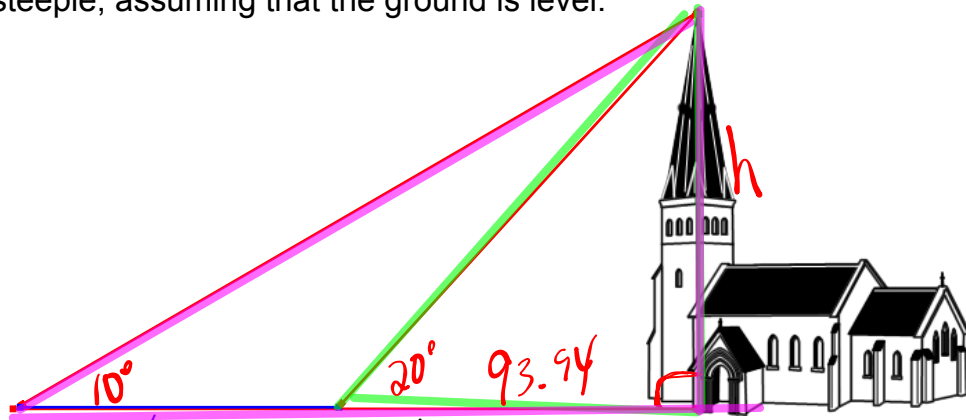
$$\tan \theta = \frac{8}{15}$$



$$\sqrt{x^2} = \sqrt{17^2 - 8^2}$$
$$x = 15$$

EXAMPLE #2:

Anita Sumtrig measured the angle of elevation of a church steeple and found it to be 10° . Then, she walked 100 m towards the steeple and measured the angle of elevation again; this time it was 20° . Find the height of the steeple, assuming that the ground is level.



$$(100+x) \tan 10^\circ = \frac{h(100+x)}{(100+x)}$$

$$(100+x) \tan 10^\circ = h$$

$$x \tan 20^\circ = \frac{h \cdot x}{x}$$

$$x \tan 20^\circ = h$$

$$h = h$$

$$(100+x) \tan 10^\circ = x \tan 20^\circ$$

$$100 \tan 10^\circ + x \tan 10^\circ = x \tan 20^\circ$$

$$17.6327 = 0.3640x - 0.1763x \iff 100 \tan 10^\circ = x \tan 20^\circ - x \tan 10^\circ$$

$$\frac{17.6327}{0.1877} = \frac{0.1877x}{0.1877}$$

$$93.94 = x$$

$$\frac{100 \tan 10^\circ}{(\tan 20^\circ - \tan 10^\circ)} = \frac{x (\cancel{\tan 20^\circ} - \cancel{\tan 10^\circ})}{\cancel{\tan 20^\circ} - \cancel{\tan 10^\circ}}$$

```

100tan(10)/(tan(
20)-tan(10))
93.96926208
    
```

$$x =$$

$$93.97$$

$$\text{So } \tan 20^\circ = \frac{h}{93.97}$$

$$34.2 \text{ m} = h$$

Homework...

Test \Rightarrow Tues

Worksheet - Applications of Trig Ratios.doc

1-4

7-10

12, # 15, # 16

Attachments

Worksheet - Applications of Trig Ratios.doc