What's Going On?

Checking In

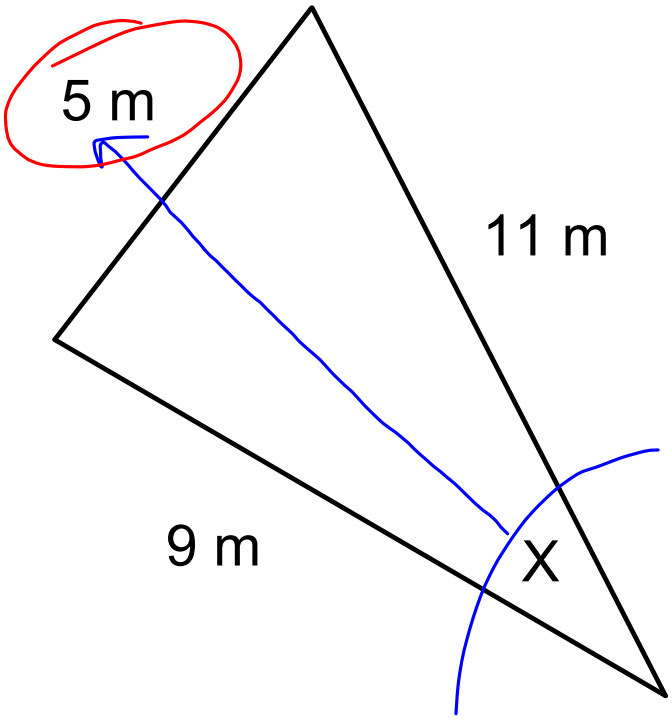
Minds on Bird Watching II

Action! The Great Trig. Heist

Consolidation The Trigonometer's Toolbox

Learning Goal - I will be able to solve trigonometry problems in 3 Dimensions.

Determine the measure of angle X



$$c^2 = a^2 + b^2 - 2ab \times \cos C$$

$$5^2 = 9^2 + 11^2 - 2(9)(11) \times \cos C$$

$$25 = 202 - 198\cos C$$

$$-202 \quad -202$$

$$\frac{-177}{-198} = \frac{-198\cos C}{-198}$$

$$\cos C = 0.8939$$

$$C = \cos^{-1}(0.8939)$$

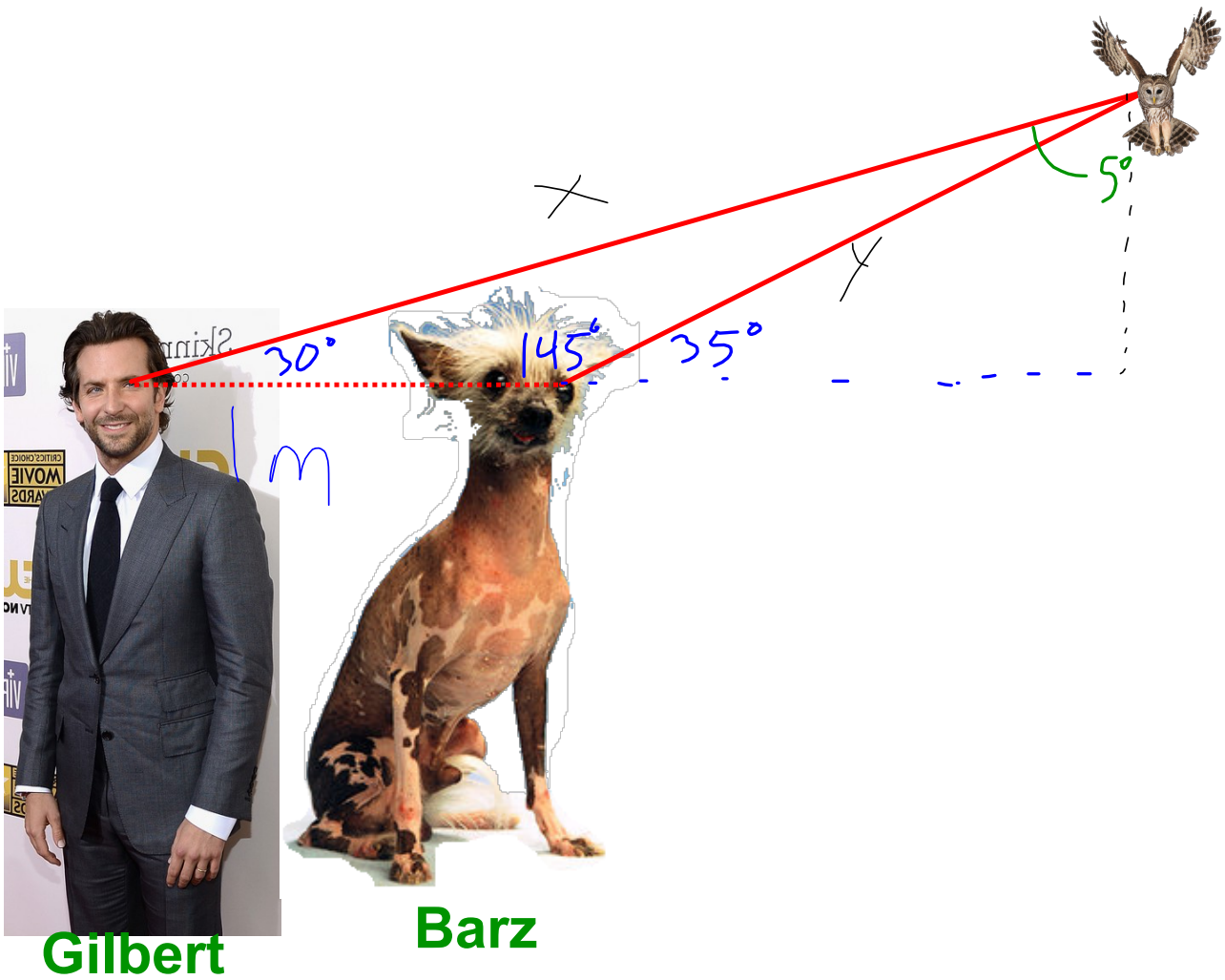
$$C \doteq 27^\circ$$

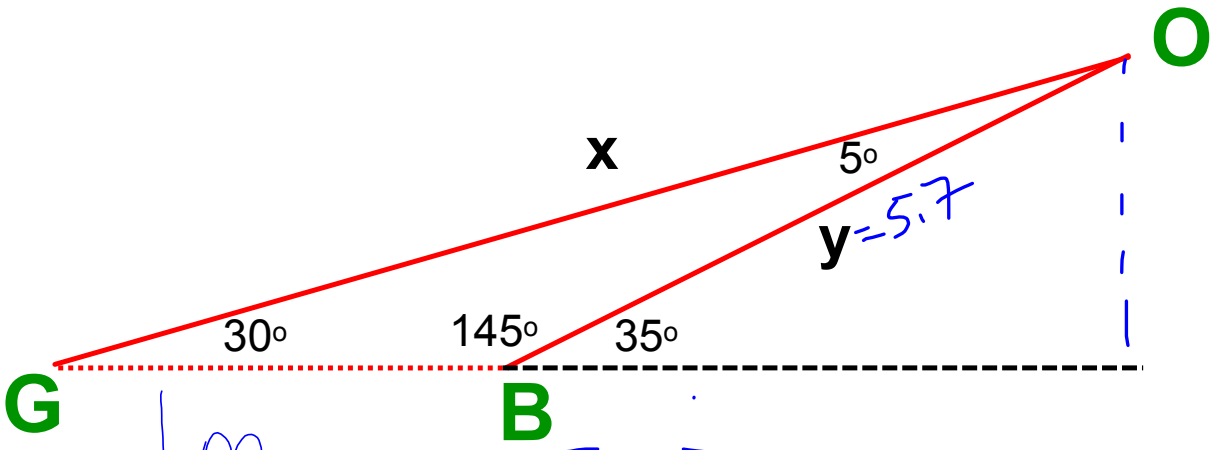
Minds on

Bird Watching II

Mr. Barz and Mr. Gilbert have spotted a Barred Owl in the night sky (Mr. Gilbert saw it first).

The angle of elevation of Mr. Barz' line of sight is 35 degrees and the angle of elevation of Mr. Gilbert's line of sight is 30 degrees. If Mr. Barz is 1 m closer to the owl, and hence without an excuse for not seeing it first, how high is the owl?

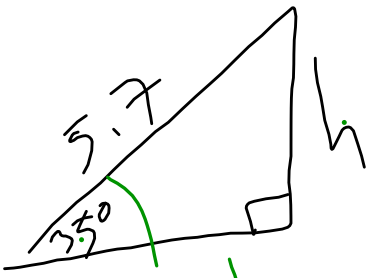

30°
145°
35°
5°
1 m
Gilbert
Barz



1 m

$$\frac{x}{\sin 145} = \frac{1}{\sin 5} = \frac{y}{\sin 30°}$$

$y \doteq 5.7\text{m}$

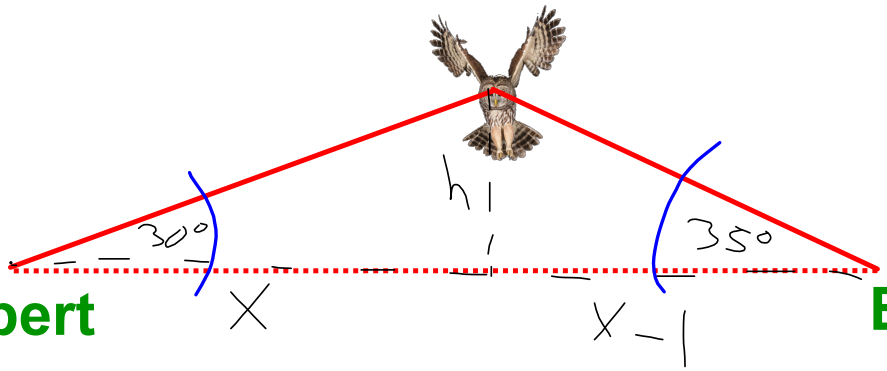


SOH

$$\sin 35° = \frac{h}{5.7}$$

$h = 5.7 \times \sin 35°$

$h \doteq 3.3\text{m}$



$x \cdot \tan 30 = h$ $\quad$ $(x-1)\tan 35 = h$

$h = x \cdot \tan 30$ $\quad$ $h = (x-1)\tan 35$

$$x \cdot \tan 30 = (x-1)\tan 35$$

$$0.5774x = (x-1)(0.7002)$$

$$0.5774x = 0.7002x - 0.7002$$

$$-0.7002x \quad -0.7002x$$

$$\frac{-0.1228x}{-0.1228} = \frac{-0.7002}{-0.1228}$$

$$x = 5.5\text{m}$$

Action!

The Great Trig Heist

You and your friend have decided to rob the Louvre.

You have determined that the best way in is to repel from the top of the Louvre Pyramid.

In order to do this, you must first determine the height of the pyramid to ensure you have enough rope to lower yourself safely to the ground.

Action!

The Great Trig Heist

To ensure that you do not arouse suspicion you avoid "Googling" the height of the pyramid. A simple search of I.P. addresses that accessed such information could get you in a lot of trouble!

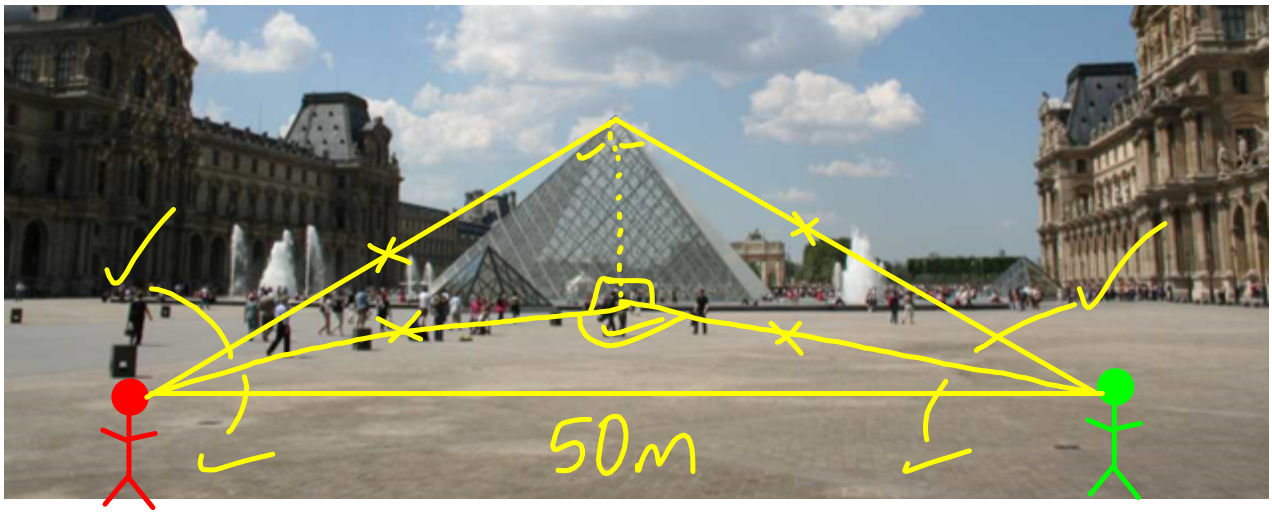
You also need to keep yourself off the Louvre security cameras so you avoid getting too close to the pyramid.

Action!

The Great Trig Heist

You and your accomplice enter the Louvre courtyard from separate locations. You have 15 seconds to get your info. and get out.

What do you do?



Action!

The Great Trig Heist

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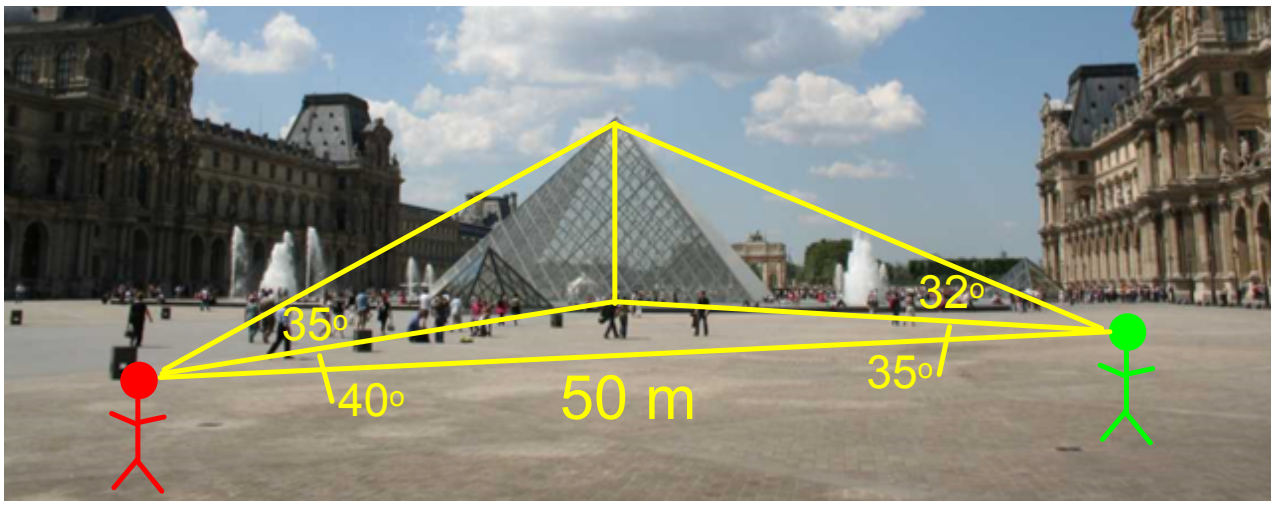
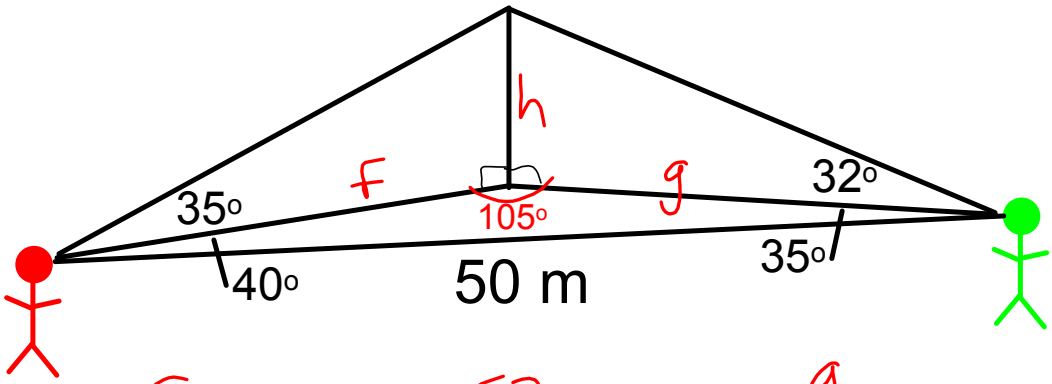


***The bottom triangle is along the ground**



$$\frac{f}{\sin 35^\circ} = \frac{50}{\sin 105^\circ} = \frac{g}{\sin 40^\circ}$$

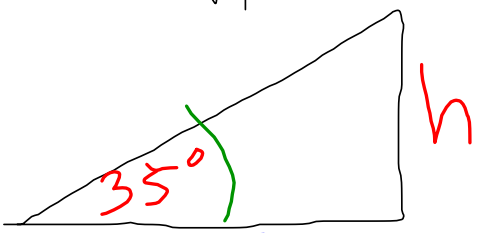
$$f = \frac{50 \times \sin 35^\circ}{\sin 105^\circ}$$

$$f = 29.7\text{ m}$$

$$g = \frac{50 \times \sin 40^\circ}{\sin 105^\circ}$$

$$g = 33.3\text{m}$$

Use f to find h

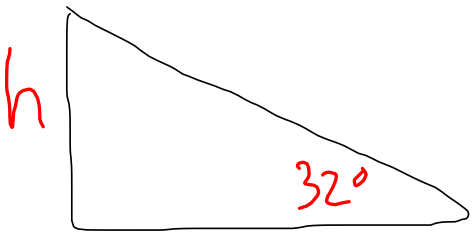


$\tan 35 = \frac{h}{29.7}$

$h = 29.7 \times \tan 35$

$h = 20.6$

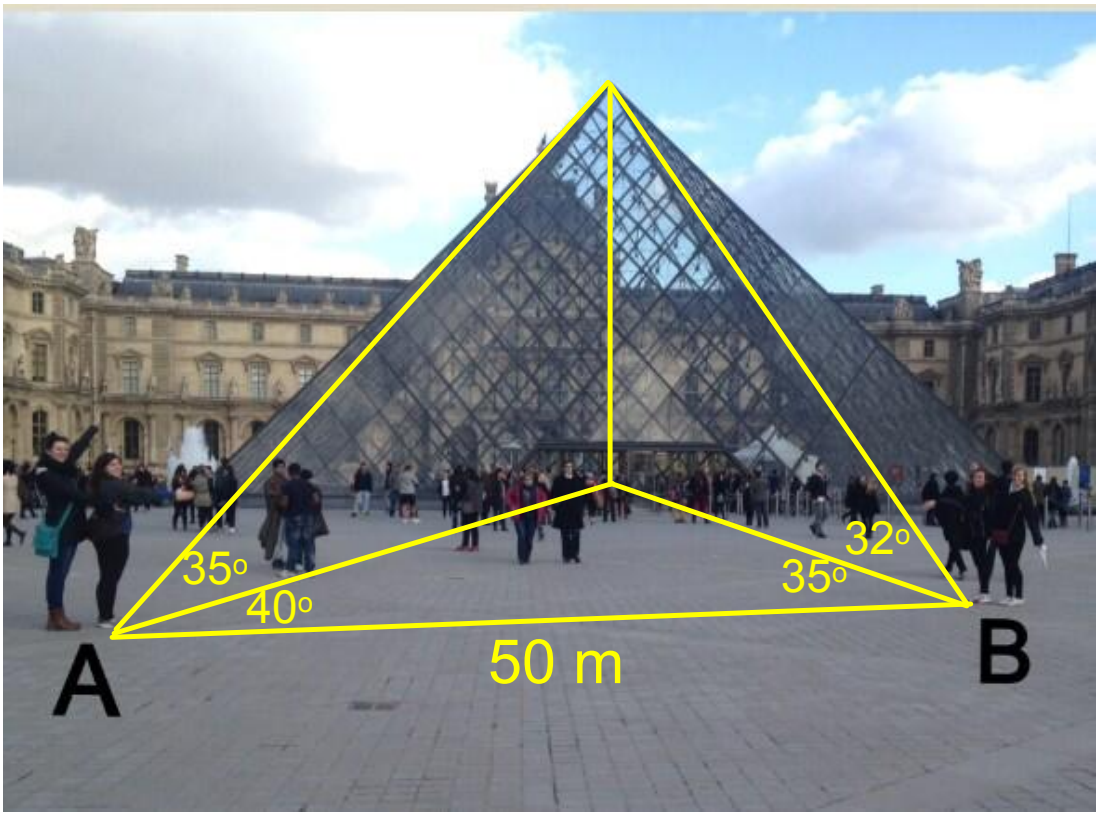
Use g to find h



$\tan 32 = \frac{h}{33.3}$

$h = 33.3 \times \tan 32$

$h = 20.6$


35°
40°
32°
35°
50 m
A
B

Consolidation

The Trigonometer's Toolbox

We will go over this tomorrow.

Essentially, we will just list all of the rules / laws / identities you have at your disposal.