What's Going On?

Checking In

Minds on The Great Trig. Heist Part II

Action! Your turn!

Consolidation The Trigonometer's Toolbox

Learning Goal - I will be able to create my own '3-D' trig problem.

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.

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.

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.

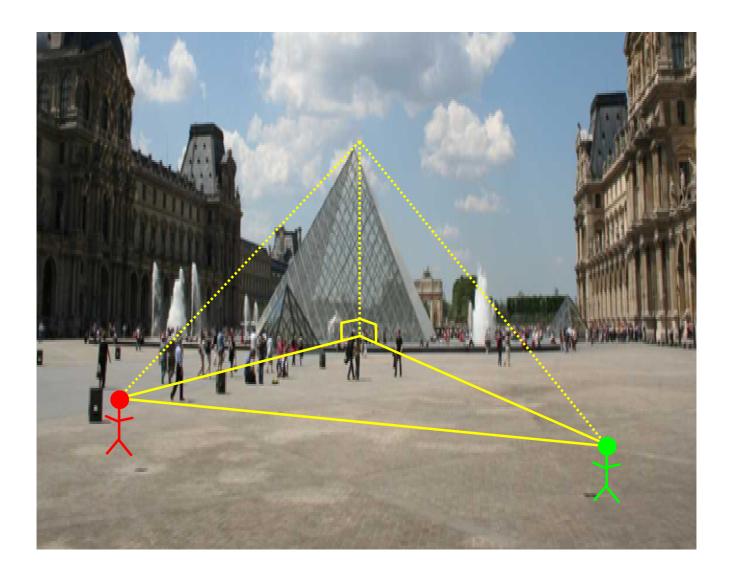
What do you do?

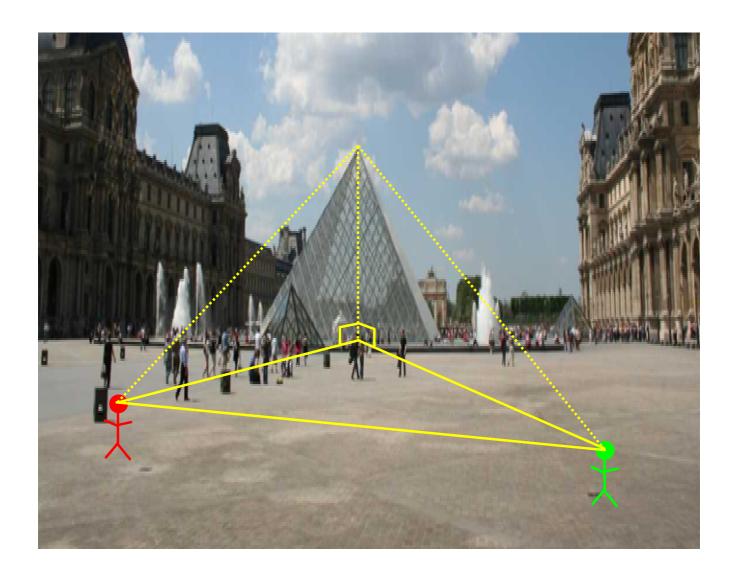


- 1. You each determine the angle of elevation between your eye and the top of the pyramid.
- 2. You each determine the angle made between your partner, yourself, and the base of the pyramid.
- 3. You determine the distance between you.
- 4. You go home and trig it up!

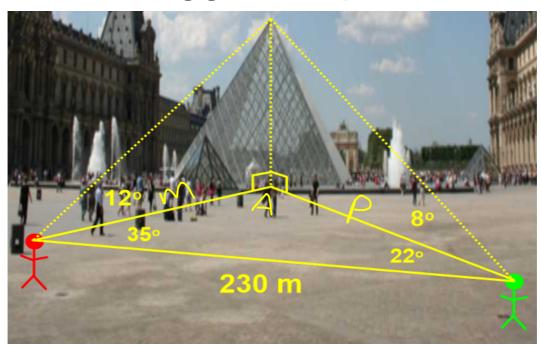
The Great Trig Heist

- 1. You each determine the angle of elevation between your eye and the top of the pyramid.
- Your line of sight is at an angle of elevation of 12 degrees.
- Your partner's line of sight is at an angle of elevation of 8 degrees.
- 2. You each determine the angle made between your partner, yourself, and the base of the pyramid.
- The angle made between you, the base of the tower and your partner is 35 degrees.
- The angle made between your partner, the base of the pyramid and you is 22 degrees.
- 3. You determine the distance between you.
- The distance between you and your partner is 230 m.
- 4. You go home and trig it up!





Triggin' it Up!



$$2A = 123^{\circ}$$
 $(180 - 35 - 22)$

Sine Law toget on or P

 $\frac{230}{5' \cdot n^{2}} = \frac{230}{5' \cdot n^{2}} = \frac{1}{5' \cdot n^{2}}$
 $\frac{1}{5' \cdot n^{2}} = \frac{1}{5' \cdot n^{2}}$

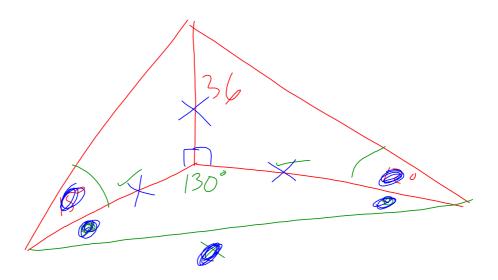
tan 120= h 102.7

h=102,7x+an/2" h - 2 1 1

- height is ~ 22m.

tan 40 = 1

h= (57.3 xtan 60 h = 22,



Action!

Your Turn!

Create a problem, modelled after the Louvre problem from scratch! Choose an object who's height you know (Google it).

You must provide the angles of elevation, angles on the ground between the people and the base of the tower and the distance between the people.

It has to work!

The Trigonometer's Toolbox

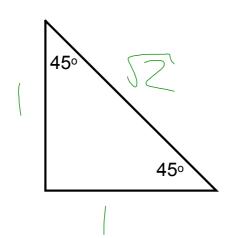
sohcahtoa /

The Reciprocal Ratios

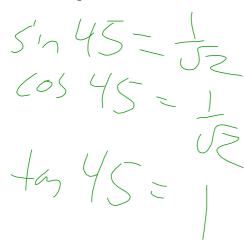
$$\csc \theta = \frac{1}{\sin \theta} \quad \sec \theta = \frac{1}{\cos \theta} \quad \cot \theta = \frac{1}{\tan \theta}$$

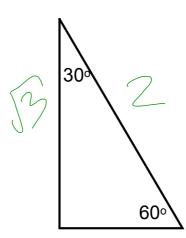
The Trigonometer's Toolbox

The Special Triangles



The Special Ratios



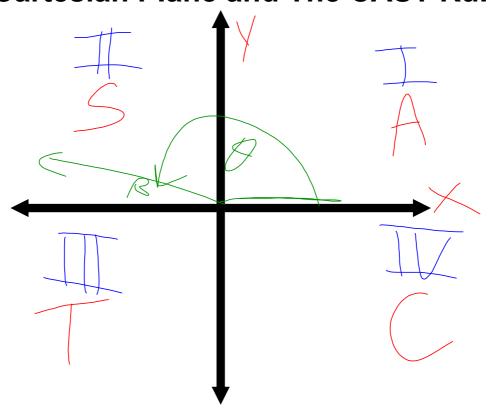


60545 = 152 = 0.707

(0545- 12 = 0.707 2

The Trigonometer's Toolbox

The Cartesian Plane and The CAST Rule



The Trigonometer's Toolbox

The Basic Identities

$$\sin \theta = \frac{y}{r}$$
 $\cos \theta = \frac{x}{r}$ $\tan \theta = \frac{y}{x}$

Quotient Identities

$$\tan \theta = \frac{\sin \theta}{\cos \theta} \qquad \cot \theta = \frac{\cos \theta}{\sin \theta}$$

Pythagorean Identities

$$\sin^2 \theta + \cos^2 \theta = 1$$

$$1 + \tan^2 \theta = \sec^2 \theta$$

$$1 + \cot^2 \theta = \csc^2 \theta$$

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The Sine Law

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

The Trigonometer's Toolbox

The Cosine Law

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

$$C = \cos^{-1}\left(\frac{a^2 + b^2 - c^2}{2ab}\right)$$

Review Homework

Pg. 338 - 339

1 - 13 (ALL)

Pg. 340

1 - 8 (ALL)

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