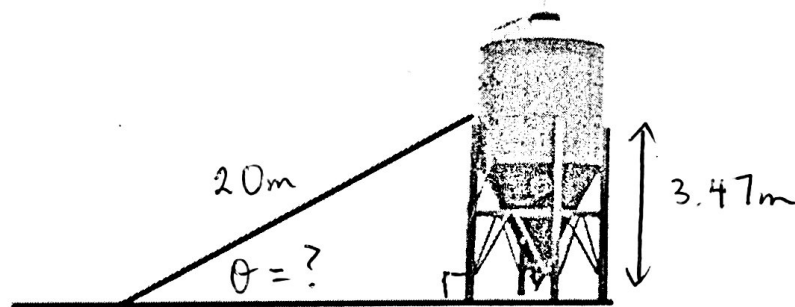


Solving Right Angle Triangles for Angles | MFM2P

Mr. Smith's friend Ryan is back at his job, again. The conveyor belt that he built previously has a limit on how steep it can be. To be up to code, ramp must make a 10° angle with the ground. If the belt is 20m long, and reaches 3.47 m off the ground, is the ramp up to code?

Label the diagram with Mr. Smith and follow along as we find our first angle:

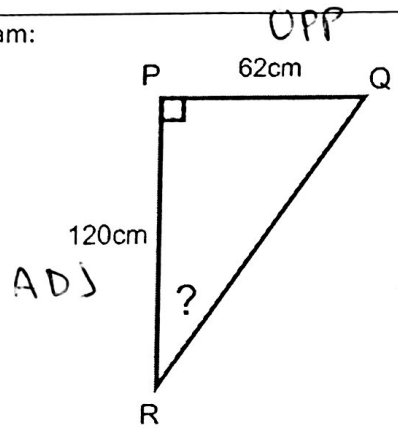


Up until now we have only been finding sides in a right angle triangle. Now we are going to find angles. Let's try a couple more.

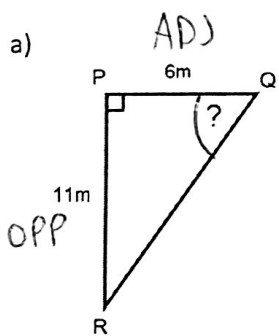
<p>Diagram:</p>	<p>Set up a Proportion and Solve:</p> $\sin \theta = \frac{\text{opp}}{\text{hyp}}$ $\sin \theta = \frac{3.47}{20} \quad \text{PLUG IN}$ $\sin \theta = 0.1735$ $\theta = \sin^{-1}(0.1735)$ $\theta = 10^\circ$
<p>Which ratio will solve the problem?</p> <p style="text-align: center;"> <input checked="" type="radio"/> $\frac{O}{H}$ <input type="radio"/> $\frac{A}{H}$ <input type="radio"/> $\frac{O}{A}$ </p>	

It's up to code.

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<p>Diagram:</p> 	<p>Set up a Proportion and Solve:</p> $\tan R = \frac{\text{opp}}{\text{adj}}$ $\tan R = \frac{62}{120}$ $\tan R = 0.5167$ $R = \tan^{-1}(0.5167)$ <div style="border: 1px solid black; padding: 5px; display: inline-block;"> $R = 27.3^\circ$ </div>
<p>Which ratio will solve the problem?</p> <p style="text-align: center;"> $\frac{O}{H}$ $\frac{A}{H}$ $\left(\frac{T}{A}\right)$ </p>	

Let's try some more without the structure now that you get the idea. For the following triangles, use the appropriate ratio to find the unknown angle.



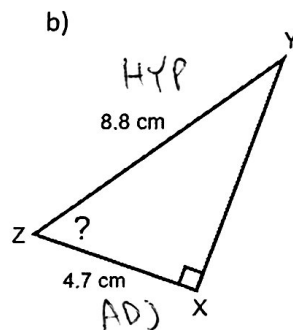
$$\tan Q = \frac{\text{opp}}{\text{adj}}$$

$$\tan Q = \frac{11}{6}$$

$$\tan Q = 1.8333$$

$$Q = \tan^{-1}(1.8333)$$

$Q = 61.4^\circ$



$$\cos Z = \frac{\text{adj}}{\text{hyp}}$$

$$\cos Z = \frac{4.7}{8.8}$$

$$\cos Z = 0.5341$$

$Z = 57.1^\circ$

KEY IDEA: On our calculators, when we are finding sides we use these buttons:

sin
cos
tan

When we are finding angles we use these buttons:

sin⁻¹
cos⁻¹
tan⁻¹