

Chapter Review

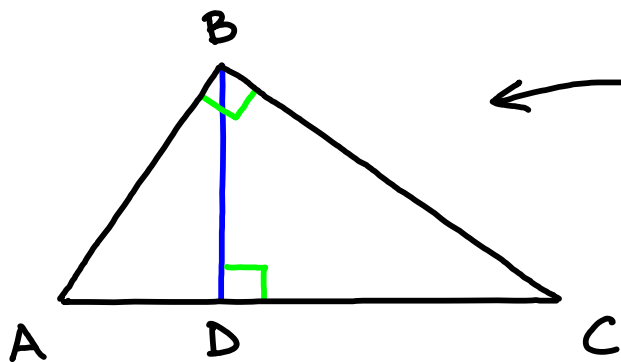
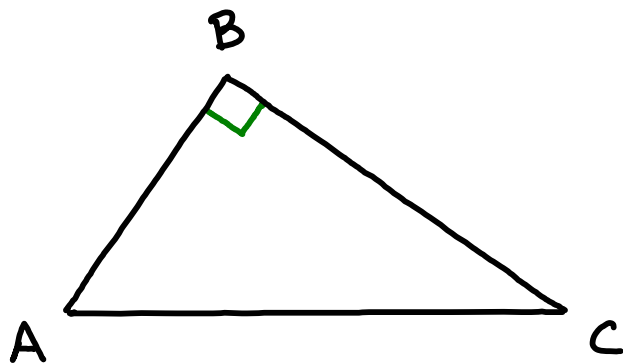


Similar Right Triangles

- 1. The altitude drawn from the hypotenuse of a right triangle creates three similar triangles*
- 2. Use ratios and proportions to solve similar right triangle problems*

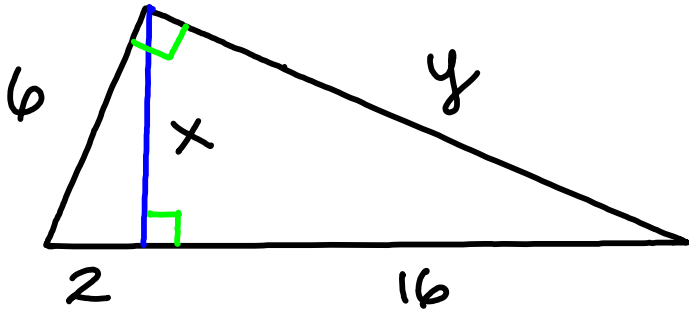
Similar Right Triangle Theorem

If the altitude is drawn to the hypotenuse of a right triangle, then two triangles formed are similar to the original triangle and each other.

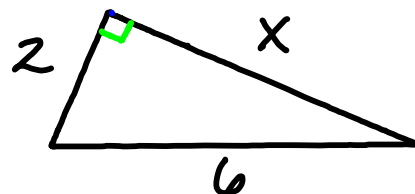
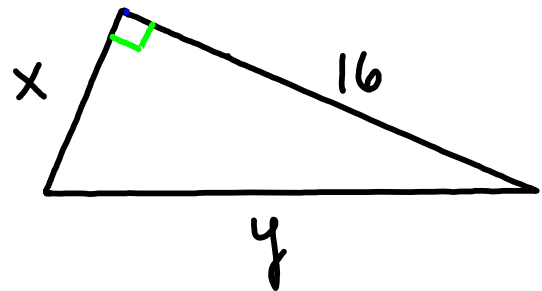
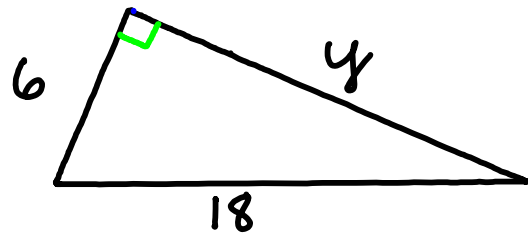


three similar right triangles are formed

Use ratios and proportions to solve similar right triangle problems

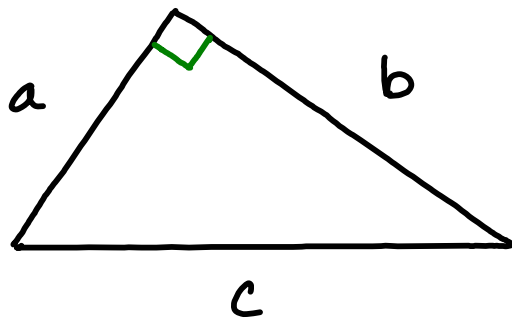


Below are the three similar right triangles that are formed

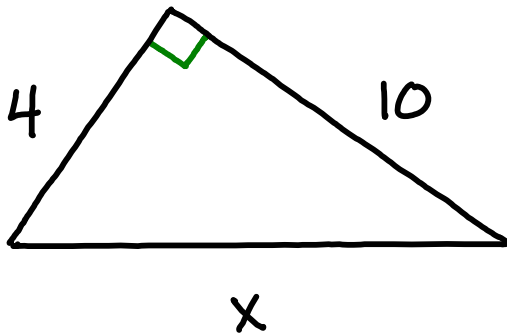




The Pythagorean Theorem



$$a^2 + b^2 = c^2$$



$$\begin{aligned}4^2 + 10^2 &= x^2 \\16 + 100 &= x^2 \\116 &= x^2\end{aligned}$$

$$x = \sqrt{116}$$

always
simplify radicals \rightarrow

$$x = \sqrt{4} \cdot \sqrt{29}$$

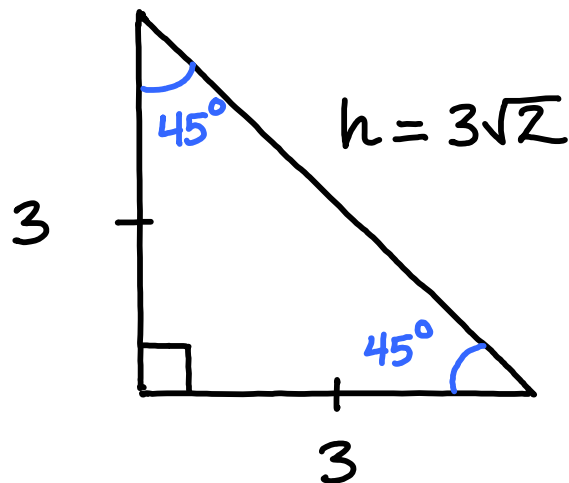
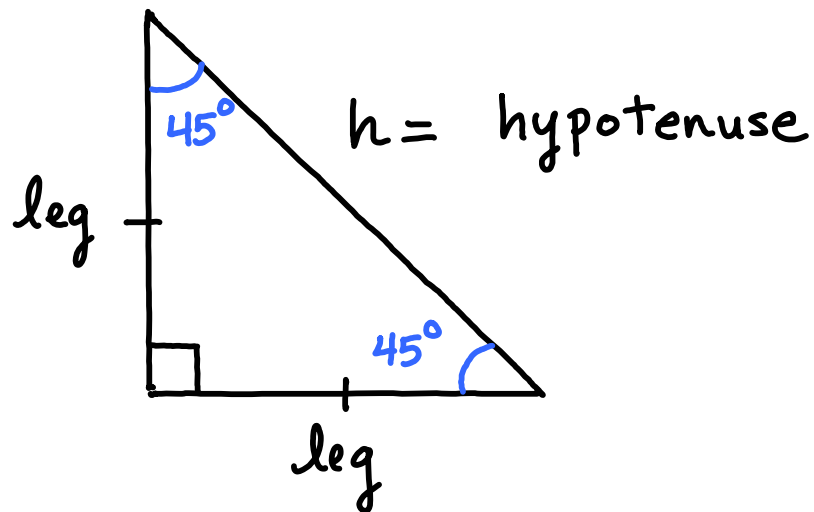
$$x = 2\sqrt{29}$$



Special Right Triangles

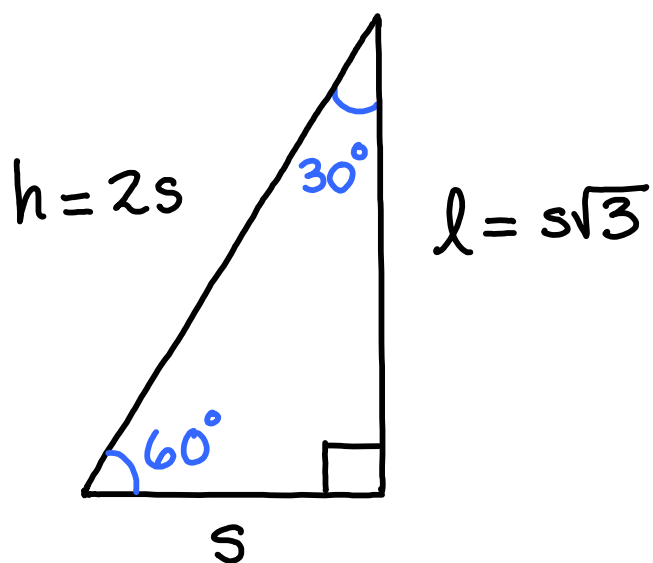
45-45-90 triangle

$$h = \text{leg} \cdot \sqrt{2}$$

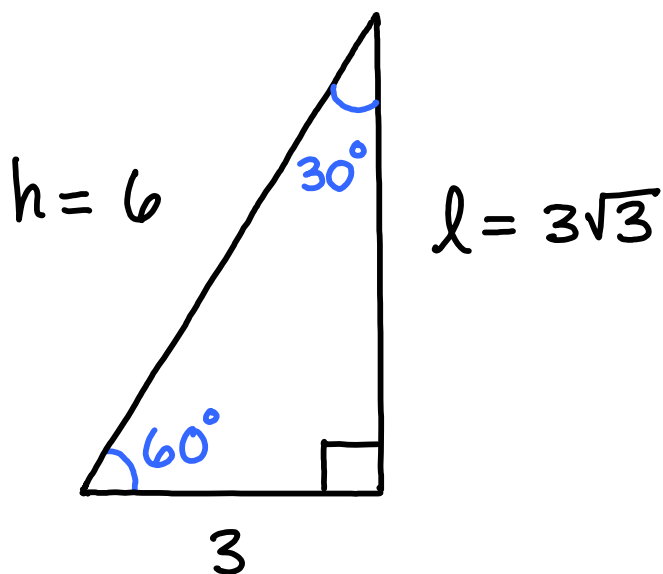


30-60-90 triangle

$$h = \text{hypotenuse} = 2 \cdot \text{shorter leg}$$
$$l = \text{longer leg} = \sqrt{3} \cdot \text{shorter leg}$$



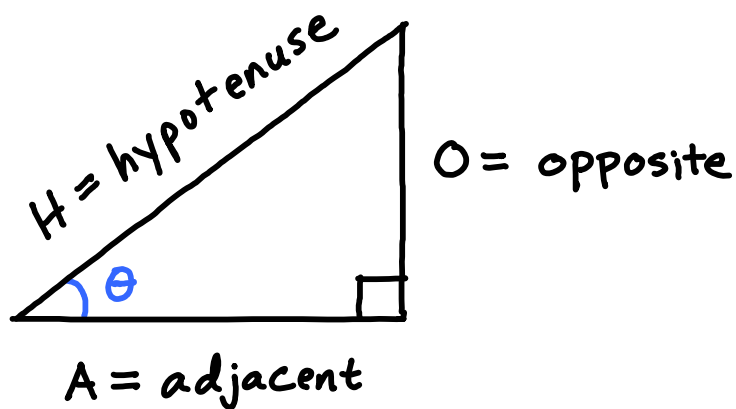
h = hypotenuse
l = longer leg
s = shorter leg





Trigonometric Ratios

"SOH-CAH-TOA" Tangent, Sine and Cosine



"SOH"

$$\sin \theta^\circ = \frac{O}{H}$$

"CAH"

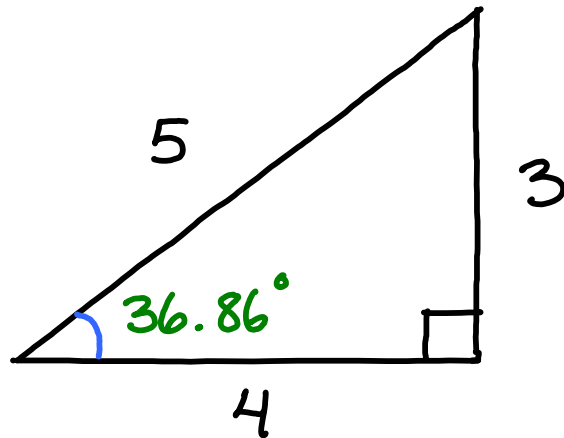
$$\cos \theta^\circ = \frac{A}{H}$$

"TOA"

$$\tan \theta^\circ = \frac{O}{A}$$

- 1. Trigonometry is the study of the relationship of the angles and sides of a right triangle; knowledge of the Pythagorean Theorem is essential.*
- 2. The three primary trigonometric ratios are the sine, cosine and tangent; "SOH-CAH-TOA" will help you remember the ratios.*
- 3. Use your scientific calculator to find the sine, cosine or tangent of an angle(make sure your calculator is set on degree mode)*
- 4. Use the inverse function(generally the shift key + trig function on most calculators) to find the angle given the value of a trigonometric ratio.*

Calculating trig ratios given the sides of the triangle



$$\sin \theta^\circ = \frac{O}{H}$$

$$\sin(36.86^\circ) = \frac{3}{5} = .60$$

$$\cos \theta^\circ = \frac{A}{H}$$

$$\cos(36.86^\circ) = \frac{4}{5} = .80$$

$$\tan \theta^\circ = \frac{O}{A}$$

$$\tan(36.86^\circ) = \frac{3}{4} = .75$$

Calculating trig ratios with a calculator

$$\boxed{\sin} (36.86) \boxed{=} .60$$

* make sure calculator is in degree mode

$$\sin(36.86^\circ) = \frac{3}{5} = .60$$

Find the angle given the tri ratio - will need your calculator

$$\sin^{-1}(.60) =$$

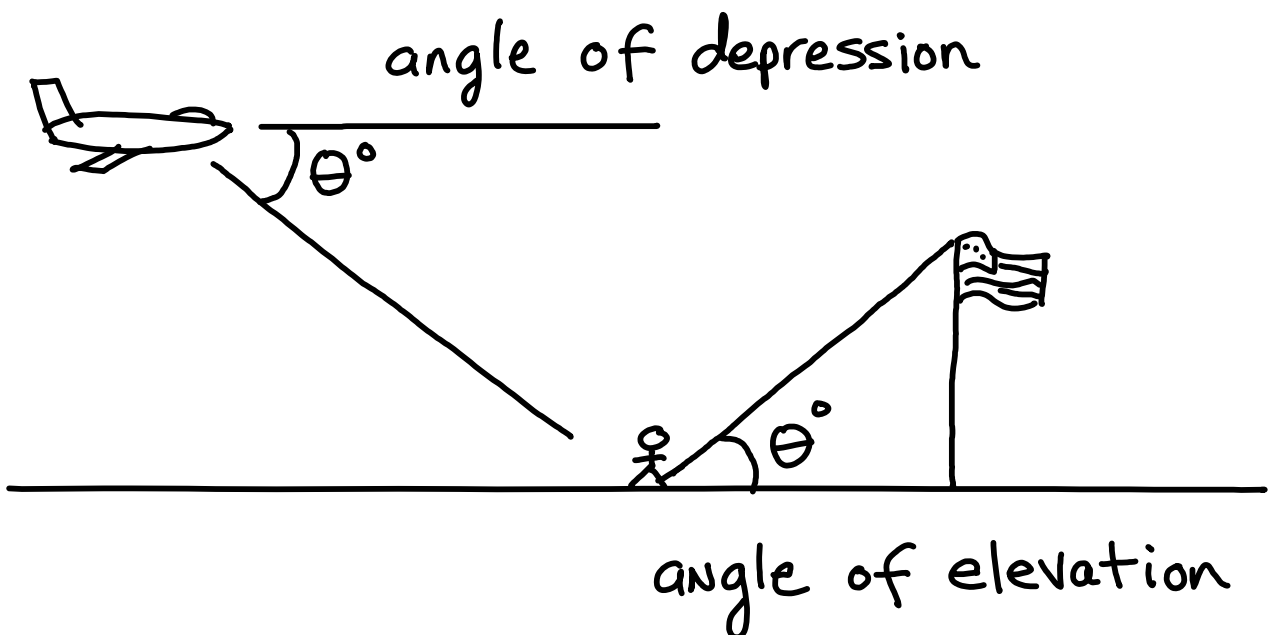
$$\boxed{\text{Shift}} \boxed{\sin} .60 \boxed{=} 36.86^\circ$$

(\sin^{-1})



Right Triangle Word Problems

1. *Trigonometry can be used to help solve any word problem that can be modeled with a right triangle.*
2. *You can think of the angle of elevation as the angle formed when you're looking up and the angle of depression as the angle formed when looking down.*
3. *When solving a right triangle word problem, focus on setting up an accurate drawing/model; then write an equation involving a trig ratio.*
4. *Don't forget to have the same units of measure*



General steps to solving a right triangle word problem

- 1. Read the problem!*
- 2. Draw a picture. Model the problem in terms of a right triangle. (make sure to have the same units of measure)*
- 3. Determine the variable to solve for (what is the question asking?)*
- 4. Use a trig ratio (sin, cos, tan) that involves the variable and given information*
- 5. Don't forget the Pythagorean Theorem.*