Trigonometry
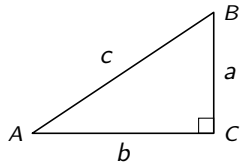
1. Use trigonometry and inverse trigonometry to find unknown angle measures and side lengths in right triangles.
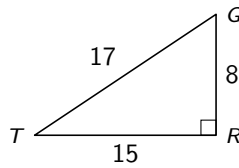
- **sine** of $\angle A = \sin A = \frac{\text{length of leg opposite } \angle A}{\text{length of hypotenuse}} = \frac{a}{c}$

- **cosine** of $\angle A = \cos A = \frac{\text{length of leg adjacent to } \angle A}{\text{length of hypotenuse}} = \frac{b}{c}$

- **tangent** of $\angle A = \tan A = \frac{\text{length of leg opposite } \angle A}{\text{length of leg adjacent to } \angle A} = \frac{a}{b}$

$$\boxed{S_H^O \ C_H^A \ T_A^O}$$

Example 1. Given the figure below, find the sine, cosine, and tangent for the indicated angle.
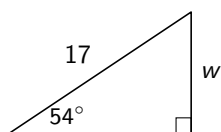
(a) $\angle T$

(b) $\angle G$

Finding Missing Side Lengths

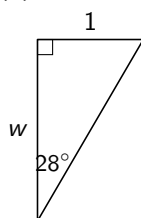To find missing side lengths in triangles using trigonometry, you can use

- the definition of trig ratios (SOH-CAH-TOA)

- your calculator

- proportions

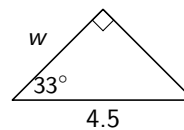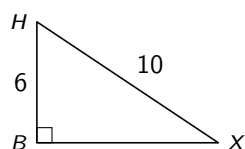**Example 2.** Find the value of w to the nearest tenth in each.

(a)

(b)

(c)

Finding Missing Angle Measures

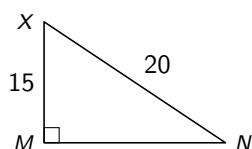To find the measures of the angles, use **inverse** trig ratios:

$\sin^{-1}$, $\cos^{-1}$, $\tan^{-1}$

Example 3. Find the measure of the indicated angle to the nearest degree.

(a) $\angle X$

(b) $\angle X$

(c) $\angle Y$