

Math 150 Lecture Notes Trigonometry of Right Triangles

The Trigonometric Ratios

$$\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos \theta = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\tan \theta = \frac{\text{opposite}}{\text{adjacent}}$$

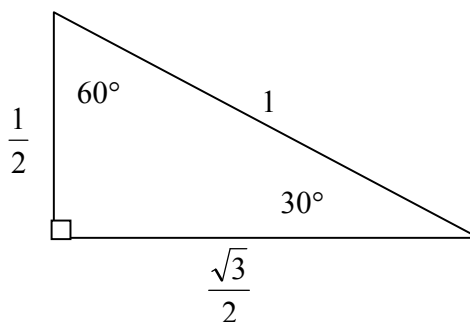
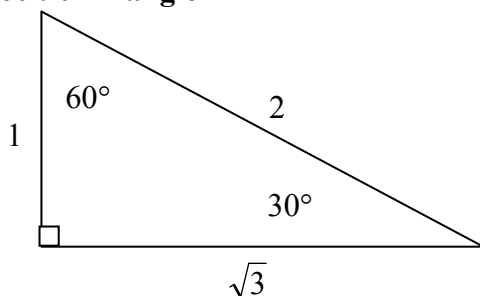
$$\csc \theta = \frac{\text{hypotenuse}}{\text{opposite}}$$

$$\sec \theta = \frac{\text{hypotenuse}}{\text{adjacent}}$$

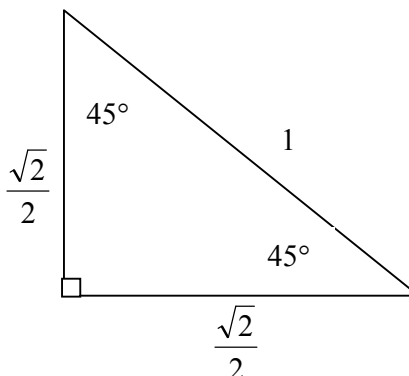
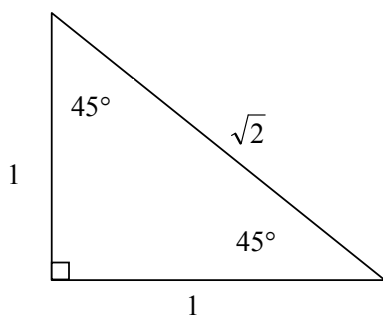
$$\cot \theta = \frac{\text{adjacent}}{\text{opposite}}$$

Special Right Triangles

30-60-90 Triangle



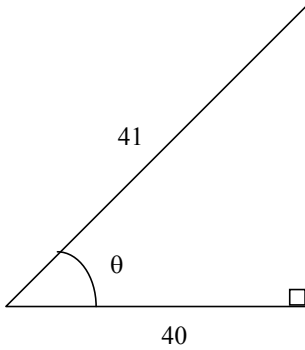
45-45-90 Triangle



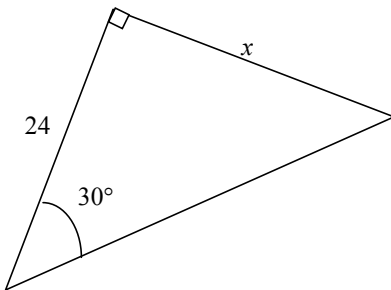
To **solve a triangle** means to determine all the side lengths and all the angle measures.

When an observer is looking at an object, the line from the eye to the object is called the **line of sight**. The **angle of elevation** is the angle from the horizontal up toward an object. The **angle of depression** is the angle down from the horizontal. The **angle of inclination** refers to an angle up an inclined plane.

Example 1: Find the exact values of the six trig ratios of the angle θ in the triangle.



Example 2: Find the value of x .



Example 3: Sketch a triangle with acute angle θ , where $\sin \theta = \frac{9}{40}$, and find the other five trig ratios of θ .

Example 4: Solve the right triangle.

