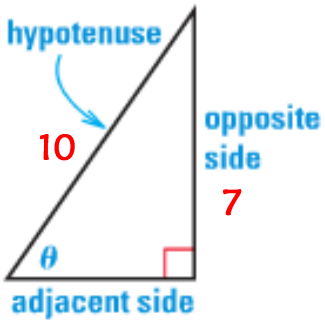
March 20, 2014

**FINDING VALUES** Let $\theta$ be an acute angle of a right triangle. Find the values of the other five trigonometric functions of $\theta$.

**12.** $\csc \theta = \frac{10}{7}$

Since csc = $\frac{\text{hyp}}{\text{opp}}$ the sides can be labelled as follows:



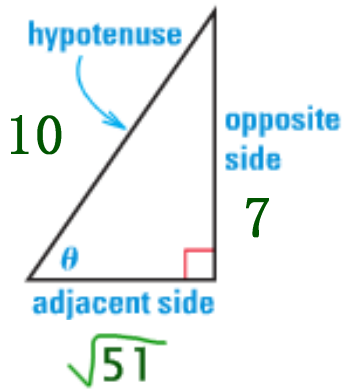

Use the pythagorean theorem to find the missing leg (x).

$x^2 + 7^2 = 10^2$

$x^2 + 49 = 100$

$x^2 = 51$

$x = \sqrt{51}$




Now find all the other trig ratios using these three side lengths.

$\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}} = \frac{7}{10}$ $\quad \cos \theta = \frac{\text{adjacent}}{\text{hypotenuse}} = \frac{\sqrt{51}}{10}$

$\csc \theta = \frac{\text{hypotenuse}}{\text{opposite}} = \frac{10}{7}$ $\quad \sec \theta = \frac{\text{hypotenuse}}{\text{adjacent}} = \frac{10}{\sqrt{51}}$

$\tan \theta = \frac{\text{opposite}}{\text{adjacent}} = \frac{7}{\sqrt{51}}$

$\cot \theta = \frac{\text{adjacent}}{\text{opposite}} = \frac{\sqrt{51}}{7}$