1. Jacob has a 16-foot ladder to help him paint. If the safest angle for his ladder to lean is 50°, what is the highest point the ladder will reach on the wall?

We will start by drawing it up. We can quickly see that we are looking for the opposite side. We are given **angle theta** (50 degrees) and the measure of the **hypotenuse** (16) of the right triangle. This means that the trigonometric ratio (SOH) Sine = Opposite / Hypotenuse can be used.

$$\sin 50 = \frac{x}{16}$$
$$0.766 = \frac{x}{16}$$
$$12.26 = x$$
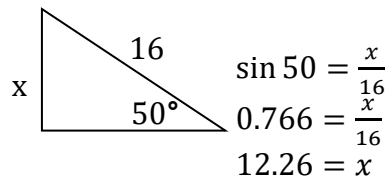
The ladder is 12.26 feet high on the wall.

2.
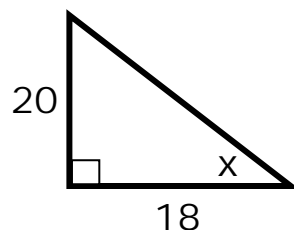
We first need to identify what we are given. We are given measures of the opposite (20) and adjacent (18) side. This would mean that the (TOA) property applies: Tangent = Opposite / Angle. To rewrite it:

Tan (θ) = 20/18

Tan (θ) = 1.11

Tan^{-1} (Tan θ) = Tan^{-1} 1.11

θ = 48º