

Example: Trigonometric Ratios in Real-Life Problems**Problem:**

The sun is shining at an angle of depression of 40 degrees. How long will a 6 foot tall man's shadow be?

Solution:

First of all, we must understand what an angle of depression is. If a line is drawn directly horizontal from the sun, a 40 degree angle of depression is 40 degrees below this line. The horizontal line from the sun and ground are parallel, so the angle made with the ground is also 40 degrees.

The man is 6 feet tall and we want to know the length of his shadow.

The side opposite 40 degrees is 6.

The side adjacent 40 degrees is x .

The tangent function uses the opposite and the adjacent sides.

Tangent of 40 degrees equals 6 divided by x .

To solve for x , first multiply both sides by x .

The x 's on the right cancel, leaving x times tangent of 40 degrees equals 6.

To solve for x , divide by the tangent of 40 degrees. x equals 6 divided by tangent of 40 degrees. This is approximately equal to 6 divided by 0.839, which is approximately 7.15.

The man's shadow is approximately 7.15 feet long.