

The Tangent Ratio

Similar triangles have the same slope (ratio of rise over run) but not the same hypotenuse.

Example – A tree casts a shadow that is 3 m long. A 150 cm tall math student, standing nearby, determines that his own shadow is 75 cm long. Draw diagrams to illustrate this scenario and determine the height of the tree.

We have been calculating a slope using rise over run.

Is it possible to determine a slope based on an angle?

The tangent function on your calculator converts an angle into a slope.

* make sure your calculator is in degree mode if the angle is measured in degrees

Example – Determine the slope of a 35° angle. Draw two similar triangles that each have this slope.

Is it possible to determine an angle based on a slope?

The inverse tangent function on your calculator is the opposite operation of the tangent function. It converts a slope into an angle.

Example – Determine the angle of elevation in a right triangle that has a height of 18 m and a base of 20 m.

Example – A right triangle has an angle of elevation of 31° . And a base length of 60 cm. Determine the height of this triangle.