

Draw 135° in standard position. The terminal side is in the second quadrant and the reference angle is 45° . Use the $45^\circ - 45^\circ - 90^\circ$ triangle to find the value of this function at the reference angle:

$$\tan 45^\circ = \frac{1}{1} = 1$$

Use the signs of x and y in the second quadrant to determine the sign of tangent:

$$\tan 135^\circ = \frac{y}{x} = \frac{(+)}{(-)} = (-)$$

$$\text{So } \tan 135^\circ = -1$$