

Date: _____

Tangent

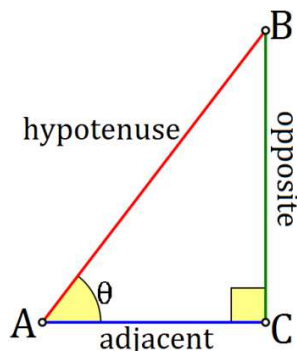
Recall:

Sine Ratio

$$\sin\theta = \frac{\text{opposite}}{\text{hypotenuse}}$$

Cosine Ratio

$$\cos\theta = \frac{\text{adjacent}}{\text{hypotenuse}}$$



There's a ratio we haven't talked about yet.

The Tangent Ratio

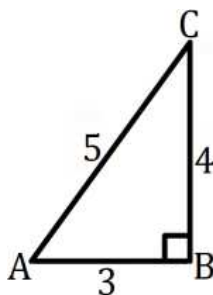
$$\tan\theta = \frac{\text{opposite}}{\text{adjacent}}$$

Example 1

State the trig ratios.

$$\tan A =$$

$$\tan C =$$



Example 2

Use a calculator to evaluate each of the following trig ratios to 4 decimal places. Make sure your calculator is in degree (DEG) mode.

a) $\tan 35^\circ =$ _____

b) $\tan 65^\circ =$ _____

Example 3

Use a calculator to find the value of the angle, in degrees, having the given trig ratio.

a) $\tan\theta = 1.1918$

b) $\tan\theta = 0.5875$

$\theta =$ _____

$\theta =$ _____

Example 4

Dorothy Vaughan is building a wheelchair ramp to a deck that is 90 cm high. The angle between the ramp and the ground must not be greater than 6° . Find the minimum allowable horizontal distance between the start of the ramp and the deck, to the nearest tenth of a metre.

Example 5

A builder wants to make a stair system with 10.5" treads and 7.5" risers. At what angle do the stairs need to be built?

$$\frac{\text{rise}}{\text{run}} = \frac{\text{length of opposite side}}{\text{length of adjacent side}} = \text{slope}$$

Homework

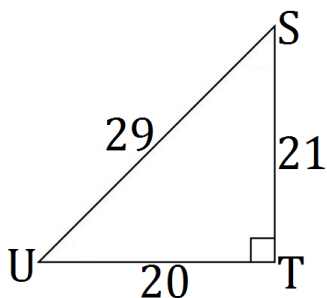
1. Find the value of the following to 4 decimal places.

a. $\tan 22.4^\circ =$ _____ b. $\tan 75^\circ =$ _____ c. $\tan 12^\circ =$ _____

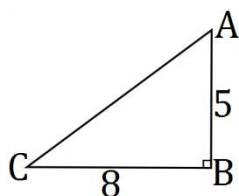
2. Find the value of theta, θ , to one decimal place.

a. $\tan \theta = 0.6375$ b. $\tan \theta = 1.1111$ c. $\tan \theta = 2.6758$

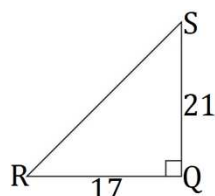
3. Find the value of angle S to one decimal place.



4. Write the tangent ratio for the indicated angle in each of the triangles below.



$\tan A =$



$\tan R =$

5. To ensure safety, ladders must be placed with a 4:1 ratio. That means if a ladder is to be placed 8 feet up the wall, it must be 2 feet from the base of the wall. What angle does the top of the ladder make with the wall?

Answers

1.

a. 0.4122

b. 3.7321

c. 0.2126

2.

a. 32.5°

b. 48.0°

c. 69.5°

3. 43.6°

4. 21.25 m

a. $\tan A = \frac{8}{5}$

b. $\tan R = \frac{21}{17}$

5. 14.0°