

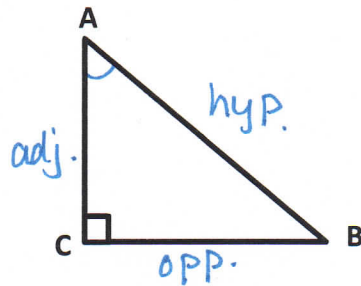
# Trigonometry: Tangent Ratio (Angles)

Date: Notes

## REMEMBER!!

In a right triangle, the tangent ratio of each non-right angle is given by (Remember TOA!):

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



For every trigonometric ratio, there is an **INVERSE** ratio. It is used to calculate **ANGLES**.

Inverse ratios are usually found on a scientific calculator by pressing 2ndF or SHIFT and then the tan, cos, or sin button.

Look at your calculator. The INVERSE for tan is  $\tan^{-1}$ . It should be just above the **tan** button.

### Example #1:

Find the measure of each angle A to the nearest degree: (Hint: use the inverse function!)

a)  $\tan A = 0.3443$

$$\angle A = \tan^{-1}(0.3443)$$

$$\angle A = 18.998$$

$$\angle A \doteq 19^\circ$$

b)  $\tan A = 2.2460$

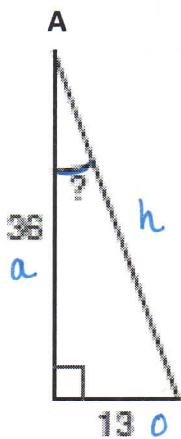
$$\angle A = \tan^{-1}(2.2460)$$

$$\angle A = 65.9996$$

$$\angle A \doteq 66^\circ$$

### Example #2:

Find the measure  $\angle A$  to the nearest degree.



$$\tan A = \frac{\text{opp}}{\text{adj}}$$

$$\tan A = \frac{13}{36}$$

$$\angle A = \tan^{-1}\left(\frac{13}{36}\right)$$

$$\angle A = 19.855$$

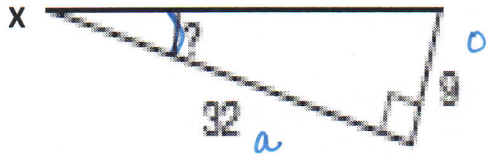
$$\angle A \doteq 20^\circ$$

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## Example #3:

Find the measure  $\angle X$  to the nearest degree.



$$\tan X = \frac{\text{opp}}{\text{adj}}$$

$$\tan X = \frac{9}{32}$$

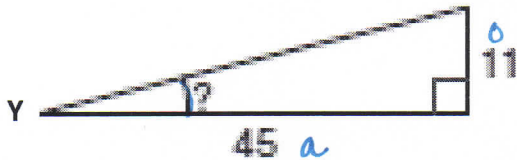
$$\angle X = \tan^{-1}\left(\frac{9}{32}\right)$$

$$\angle X = 15.7$$

$$\angle X = 16^\circ$$

## Example #4

Find the measure  $\angle Y$  to the nearest degree.



$$\tan Y = \frac{\text{opp}}{\text{adj}}$$

$$\tan Y = \frac{11}{45}$$

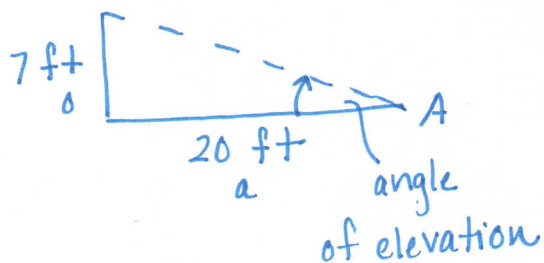
$$\angle Y = \tan^{-1}\left(\frac{11}{45}\right)$$

$$\angle Y = 13.736$$

$$\angle Y = 14^\circ$$

## Example #5:

A ramp is 7 feet high and 20 feet long on the ground. What is the angle of elevation of the ramp?



$$\tan A = \frac{\text{opp}}{\text{adj}}$$

$$\tan A = \frac{7}{20}$$

$$\angle A = \tan^{-1}\left(\frac{7}{20}\right)$$

$$\angle A = 19.29$$

$$\angle A = 19^\circ$$

$\therefore$  angle of elevation is  $19^\circ$ .