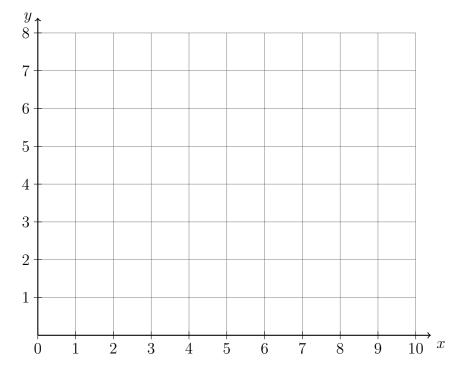
6.6 Classwork: Tangent inverse

CCSS.HSG.SRT.C.8

1. (a) Do Now: Graph and label $\triangle ABC$ with A(0,0), B(6,8), and C(6,0).



(b) Find the lengths of the sides of $\triangle ABC$.

$$AC =$$

$$BC =$$

$$AB = \sqrt{AC^2 + BC^2}$$

(c) Find the slope and y-intercept of the line \overleftrightarrow{AB} .

$$m_{AB} =$$

$$b_{AB} =$$

(d) Write down the equation of each line.

 \overrightarrow{AB} :

 \overrightarrow{BC} :

 \overleftrightarrow{AC} :

- (e) Find the measure of $\angle BAC = \theta$ in degrees with a protractor.
- (f) Find the slope of \overrightarrow{AB} using the tangent function.

$$\tan(\theta) =$$

2. Use a calculator. Complete the table mapping angle measures to slope.

(a)	tan	15°	=
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 $\begin{array}{c|c} \text{angle } \theta & \tan(\theta) \\ \hline 0 & 0 \\ \end{array}$

(b)
$$\tan 30^{\circ} =$$

 15°

(c)
$$\tan 45^{\circ} =$$

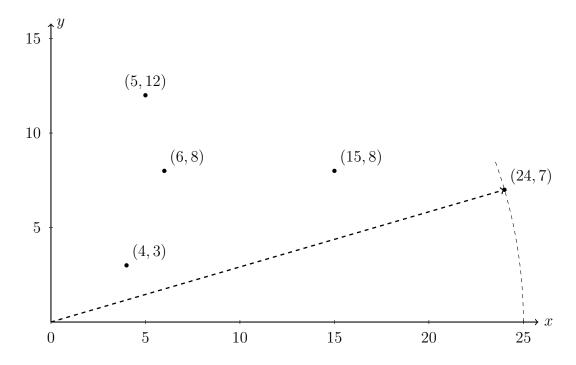
(d)
$$\tan 60^{\circ} =$$

(e)
$$\tan 75^{\circ} =$$

(f)
$$\tan 90^{\circ} =$$

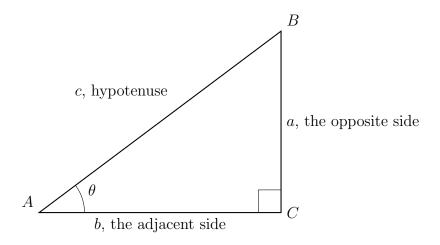
3. Complete the table. Use the Pythagorean theorem, $a^2 + b^2 = c^2$, and your table in #2.

coordinate pair (x, y)	hypotenuse (c)	slope (m)	angle θ
(24,7)	25	0.29	16°
(15, 8)	17	$0.5\overline{3}$	28°
(4,3)			
(6, 8)			
(5, 12)			



Definitions and vocabulary

Right triangle $\triangle ABC$ with side lengths a, b, c. $m \angle A = \theta$



A *Pythagorean triple* is a set of three positive integers that satisfies $a^2 + b^2 = c^2$. They comprise the side lengths of a right triangle.

The *tangent* function maps angle measures onto slope, rise over run, or opposite over adjacent.

$$\tan(\theta) = \frac{opposite}{adjacent}$$

The *inverse tangent* function maps slope onto angle measure. It is the opposite of the tangent function.

$$\tan^{-1}\left(\frac{opposite}{adjacent}\right) = \theta$$

The most common units of angle measures are degrees, radians, and grads.

Unit	full turn	quarter turn
degrees	360°	90°
radians	2π	$\frac{\pi}{2}$
grads	400	100

Convert radians to degrees with the formula

$$\pi \, \mathrm{radians} = 180^{\circ}$$