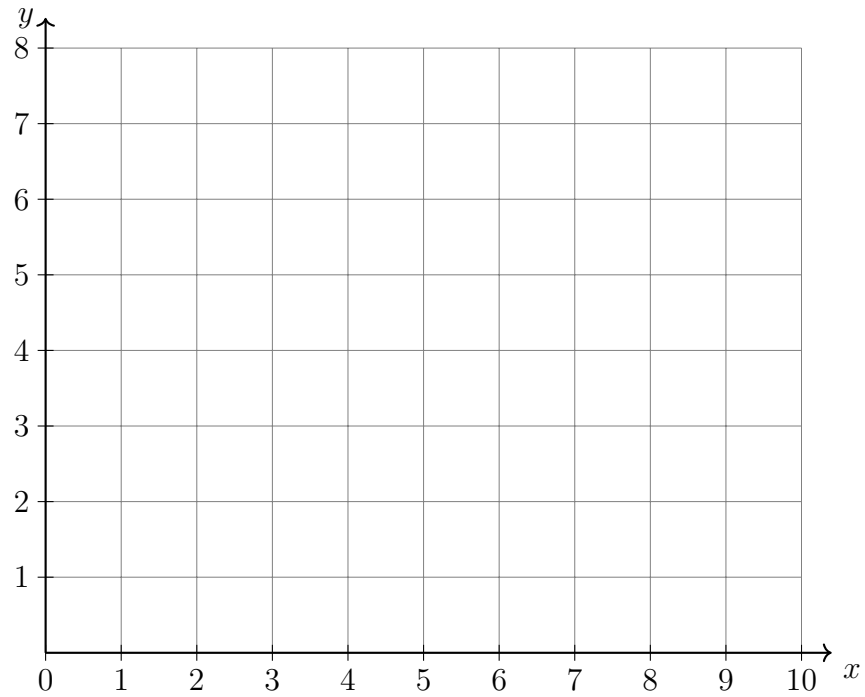
11.1 Classwork: Tangent **CCSS.HSG.SRT.C.8**

1. (a) 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.

$\overleftrightarrow{AB}$: $\overleftrightarrow{BC}$: $\overleftrightarrow{AC}$:

(e) Find the measure of $\angle BAC = \theta$ in degrees with a protractor.

(f) Find the slope of $\overleftrightarrow{AB}$ using the calculator's tangent function.

$\tan(\theta) =$

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

(a) $\tan 15° =$

(b) $\tan 30° =$

(c) $\tan 45° =$

(d) $\tan 60° =$

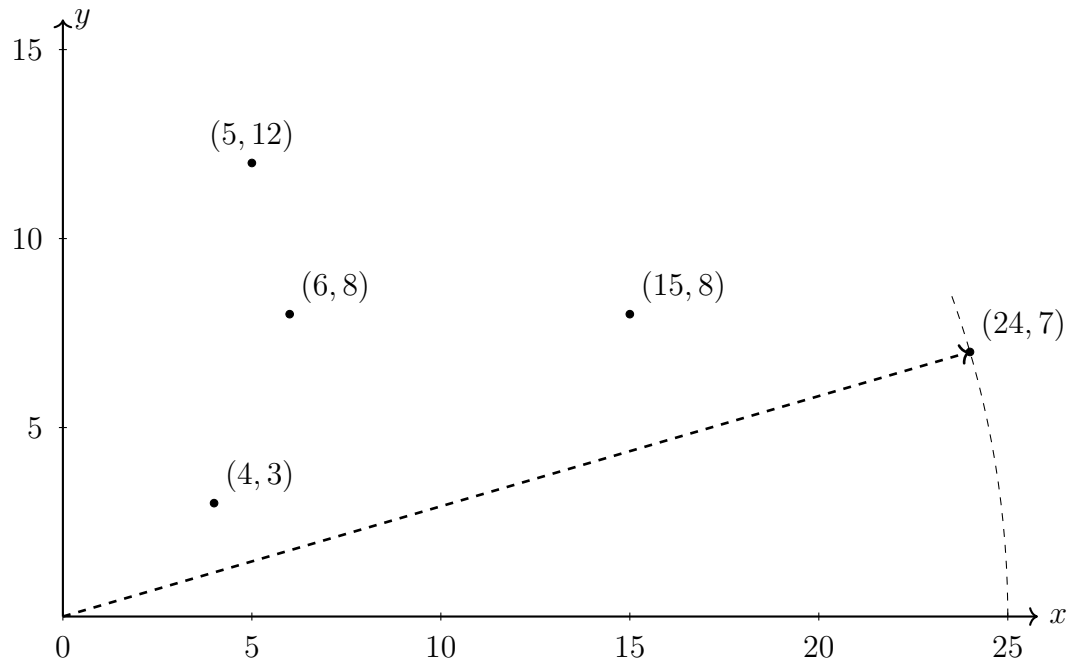
(e) $\tan 75° =$

(f) $\tan 90° =$

angle θ	$\tan(\theta)$
0	0
15°	

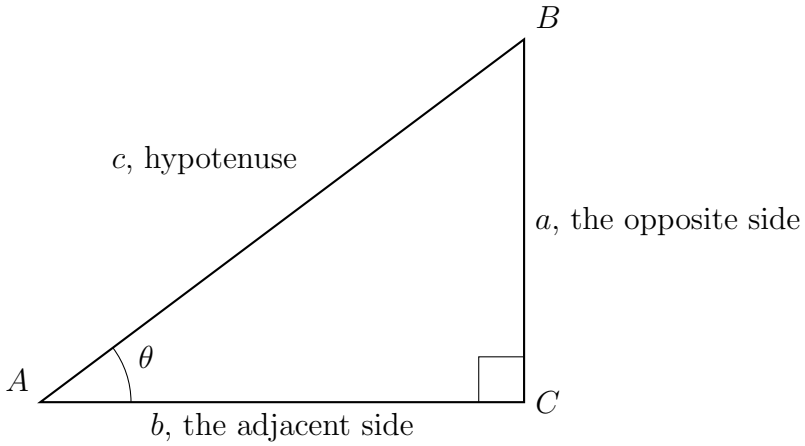
3. Complete the table. Use the Pythagorean theorem, $a^2 + b^2 = c^2$, and your table in #2.

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

$$\pi \text{ radians} = 180°$$