6.5 Classwork: Tangent function, slope **CCSS.HSG.SRT.C.8**

1. Do Now: A vector from the origin $\overrightarrow{OA}$ is shown rotated counterclockwise around O.

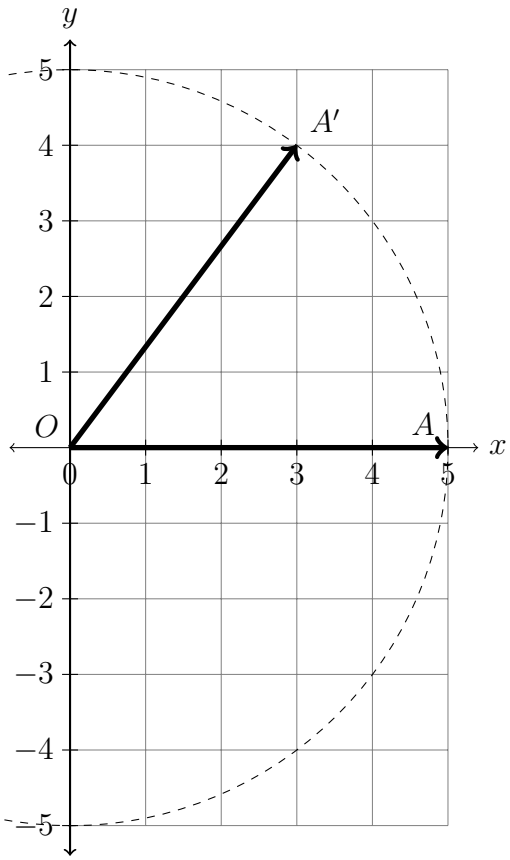
   (a) Using a protractor, measure the angle of rotation.

   (b) Write down the slope of $\overrightarrow{OA'}$.

   (c) Mark and label the point $B(4, -3)$. Draw $\overrightarrow{OB}$.

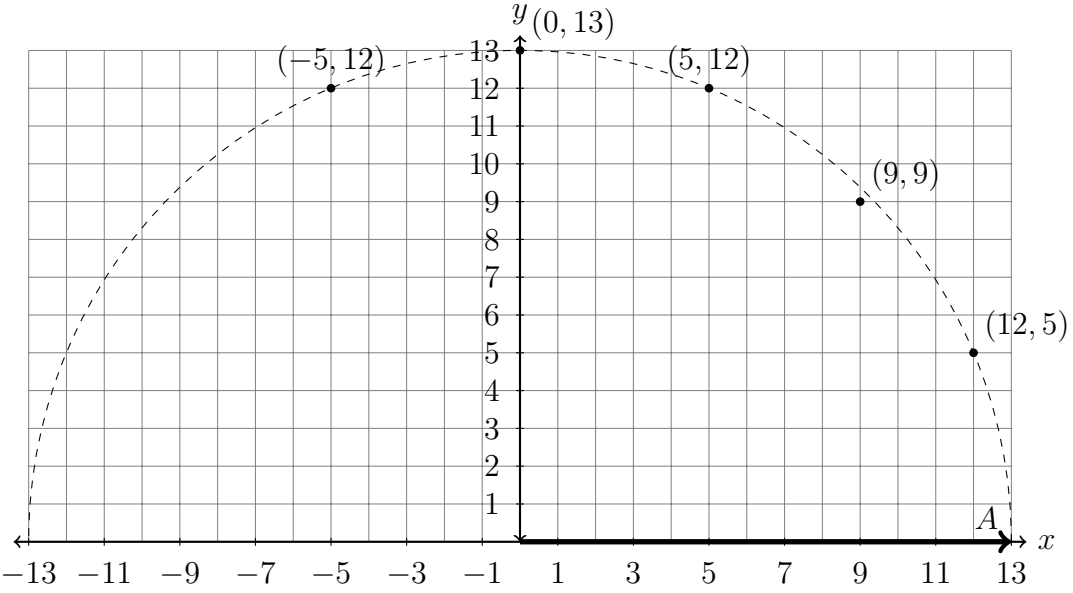
   (d) Write down the slope of $\overrightarrow{OB}$.

   (e) What is the product of the slopes of $\overrightarrow{OA'}$ and $\overrightarrow{OB}$?



2. Complete the table mapping angle of rotation onto slope. (six entries)

angle	slope
0	
	5/12



3. Use a calculator. Express the result to the nearest thousandth.

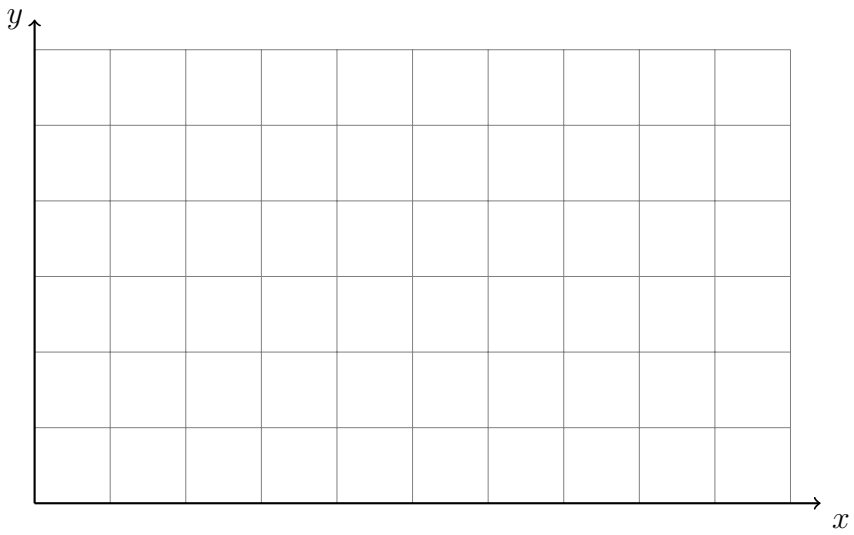
   (a) $\tan 45° =$

   (b) $\tan 30° =$

   (c) $\tan 15° =$

   (d) $\tan 65° =$

4. (a) Graph and label $\triangle ABC$ with $A(0,0)$, $B(7,4)$, and $C(7,0)$.



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

   $m_{AB} =$ $b_{AB} =$

   (c) Write down the equation of each line.

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

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

   (e) Find the slope of $\overleftrightarrow{AB}$ using the tangent function.

   $\tan(\theta) =$

5. Do Now: Write down the slope perpendicular to the given slope. (negative reciprocal)

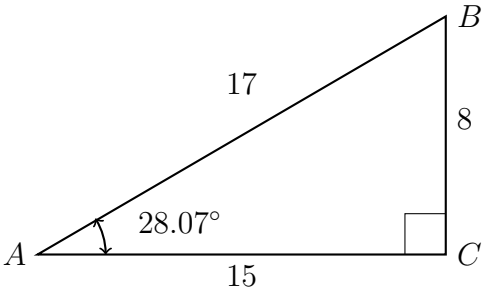
   (a) $m = \frac{1}{3}$ $\quad m_\perp =$ (b) $m = -0.8$ $\quad m_\perp =$

6. $\triangle ABC$ is shown with $m\angle C = 90°$ and the lengths of the triangle's sides are $BC = 8$, $AC = 15$, and $AB = 17$. (not drawn to scale)

   (a) How long is the *hypotenuse*?

   (b) How long is the side *opposite* $\angle A$?

   (c) How long is the side *adjacent* to $\angle A$?

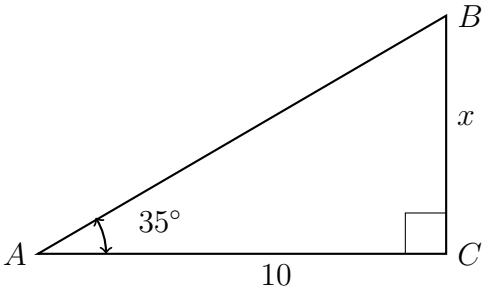


   Use Graspable Math to verify the tangent calculation.
   (paste two lines below, the substituted values shown and the final equality)

   $\tan 28.07° = \dfrac{8}{15}$

7. $\triangle ABC$ is shown with $m\angle C = 90°$, $m\angle A = 35°$, and the base with length $AC = 10$.

   Find the height $BC = x$.



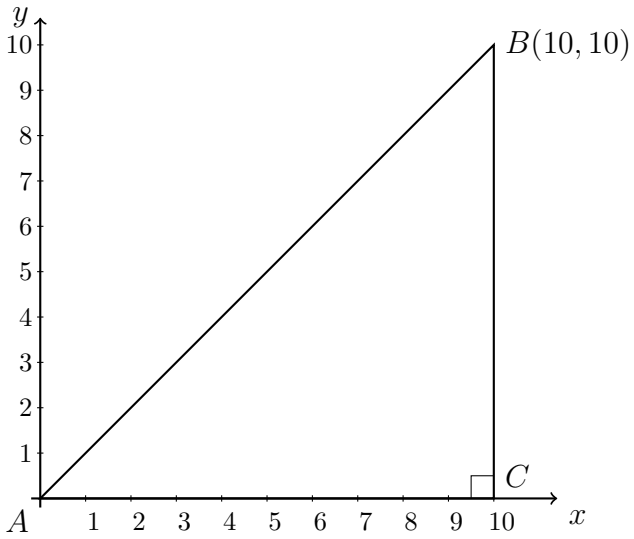
   Use Graspable Math and the tangent function: $\tan 35° = \dfrac{x}{10}$

8. Right $\triangle ABC$ is drawn in *standard position* with vertex A on the origin and right $\angle C$ on the x-axis, as shown.

   (a) Find the slope of the line segment $\overline{AB}$.

   (b) Find the measure of $\angle A$.
   Hint: isosceles triangle

(c) Find the length of the hypotenuse AB using the Pythagorean Theorem $a^2 + b^2 = c^2$. (leave as a radical)



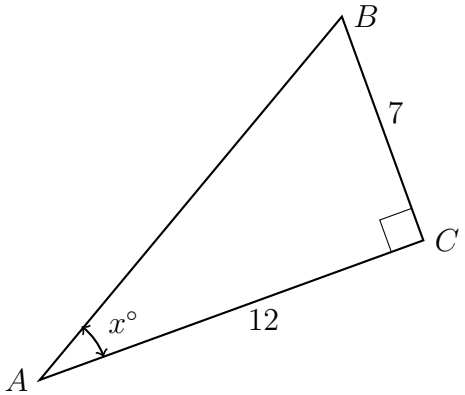
9. $\triangle ABC$ is shown with $m\angle C = 90°$ and $m\angle A = x°$. The lengths of the legs are $AC = 10$ and $BC = 7$.

   (a) Express $\tan x$ as a fraction.

   $\tan x° = \frac{?}{?}$

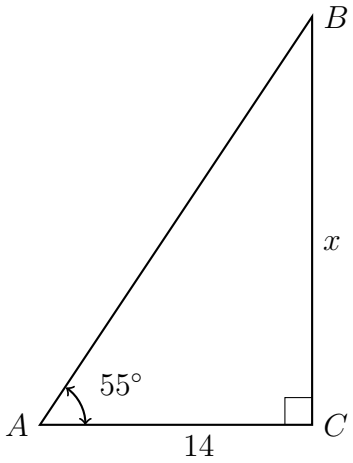
   (b) Which side is *opposite* $\angle B$?

   (c) Which leg is *adjacent* to $\angle B$?



10. $\triangle ABC$ is shown with $m\angle C = 90°$, $m\angle A = 55°$, and the base with length $AC = 14$.

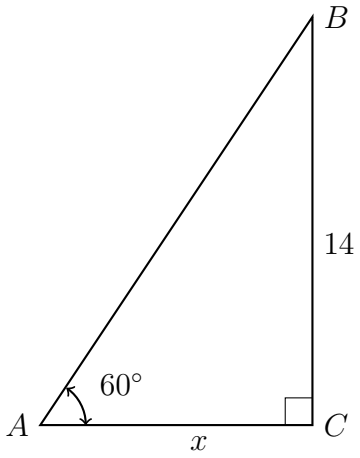
    Find the height $BC = x$.



Use Graspable Math and paste the solution starting with the substitution step.

11. $\triangle ABC$ is shown with $m\angle C = 90°$, $m\angle A = 60°$, and height $AC = 14$.

    Find the base $AC = x$.



Use Graspable Math and paste the solution starting with the substitution step.