9.3 Tangent calculations

1. Do Now: Given a triangle $\triangle ABC$ having angles with measures $m\angle A = 60°$ and $m\angle C = 90°$. Find the measure of the third angle, $m\angle B$.

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

(a) $m = 4$ $\qquad m_\perp =$

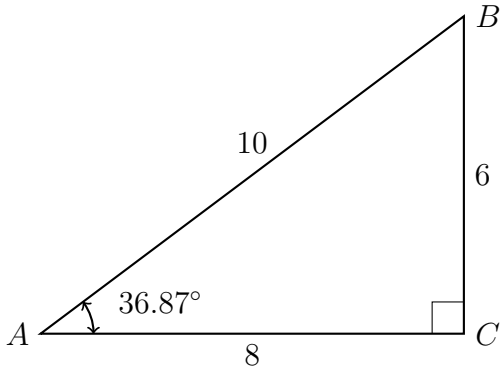
(b) $m = -\frac{5}{2}$ $\qquad m_\perp =$

3. $\triangle ABC$ is shown with $m\angle C = 90°$ and the lengths of the triangle's sides are $BC = 6$, $AC = 8$, and $AB = 10$. (not drawn to scale)

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

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

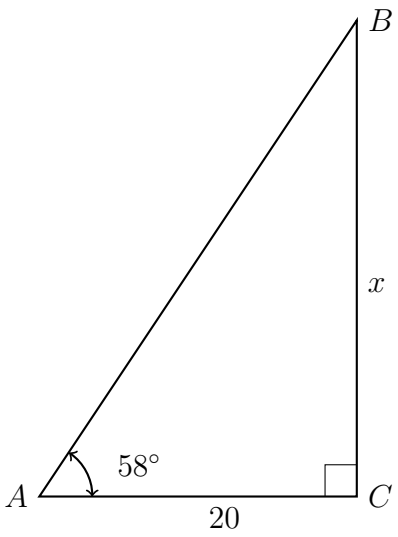
   (c) How long is the *hypotenuse*?



Use Graspable Math to verify the tangent calculation.

$$\tan 36.87° = \frac{6}{8}$$

4. $\triangle ABC$ is shown with $m\angle C = 90°$, $m\angle A = 58°$, and the base with length $AC = 20$. Find the height $BC = x$.



Use Graspable Math and the tangent function: $\tan 58° = \dfrac{x}{20}$

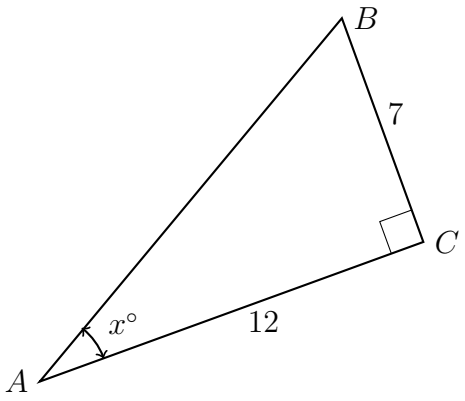
5. $\triangle ABC$ is shown with $m\angle C = 90°$ and $m\angle A = x°$. The lengths of the legs are $AC = 10$ and $BC = 7$.

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

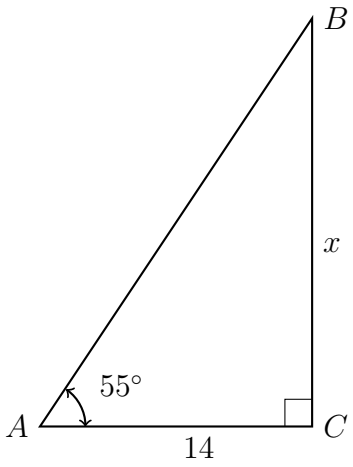
   $\tan x° = \frac{?}{?}$

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

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



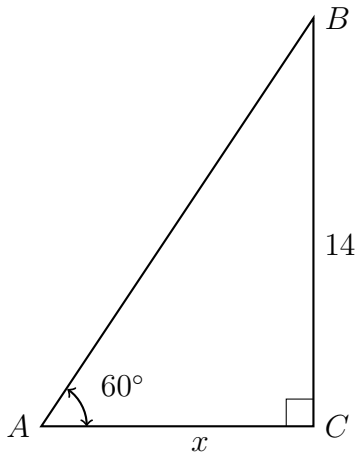
6. $\triangle ABC$ is shown with $m\angle C = 90°$, $m\angle A = 55°$, and the base with length $AC = 14$. Find the height $BC = x$.



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

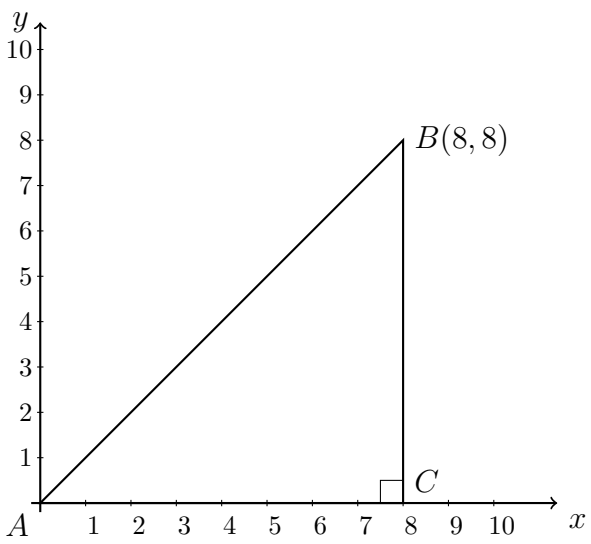
7. $\triangle ABC$ is shown with $m\angle C = 90°$, $m\angle A = 60°$, and height $AC = 14$.

   Find the base $AC = x$.



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

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)