

9.3 Tangent calculations

1. Do Now: Given a triangle $\triangle ABC$ having angles with measures $m\angle A = 60^\circ$ and $m\angle C = 90^\circ$. 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) $m = 4$ $m_{\perp} =$

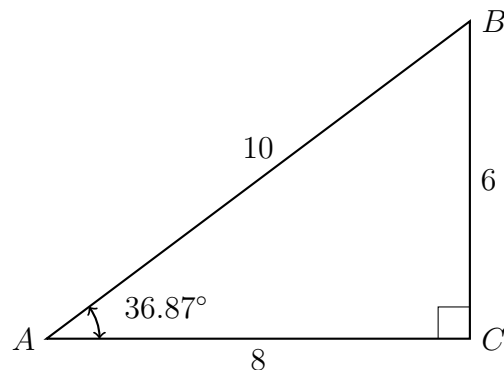
(b) $m = -\frac{5}{2}$ $m_{\perp} =$

3. $\triangle ABC$ is shown with $m\angle C = 90^\circ$ 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 $\angle A$?

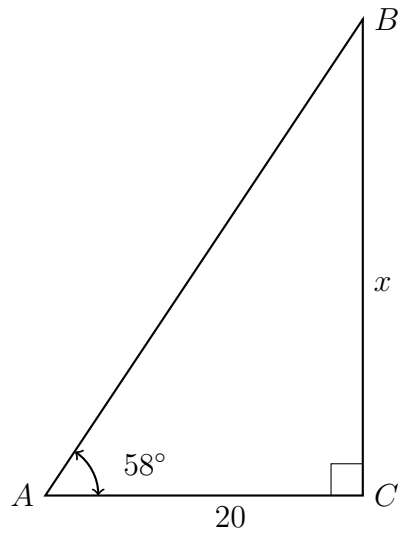
(c) How long is the *hypotenuse*?



Use Graspable Math to verify the tangent calculation.

$$\tan 36.87^\circ = \frac{6}{8}$$

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



Use Graspable Math and the tangent function: $\tan 58^\circ = \frac{x}{20}$

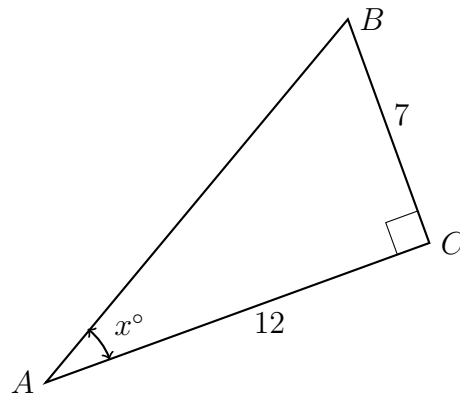
5. $\triangle ABC$ is shown with $m\angle C = 90^\circ$ and $m\angle A = x^\circ$. The lengths of the legs are $AC = 10$ and $BC = 7$.

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

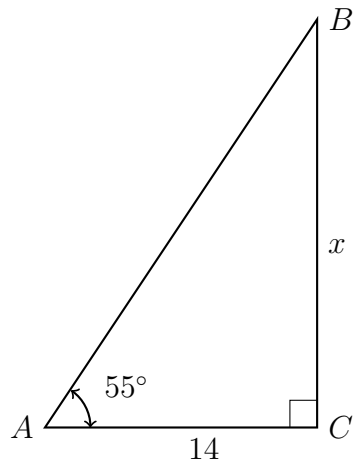
$$\tan x^\circ = \frac{?}{?}$$

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

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



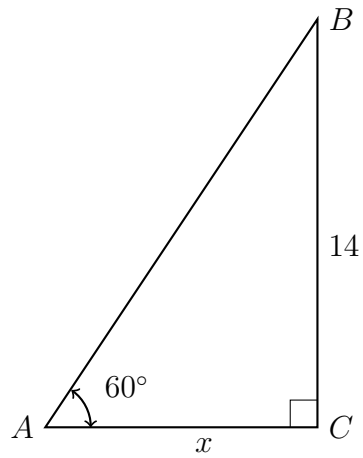
6. $\triangle ABC$ is shown with $m\angle C = 90^\circ$, $m\angle A = 55^\circ$, and the base with length $AC = 14$. Find the height $BC = x$.



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

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

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)

