

9.2 Tangent and slope

1. Do Now: Given a triangle $\triangle ABC$ having angles with measures $m\angle A = 45^\circ$ and $m\angle C = 90^\circ$. Find the measure of the third angle, $m\angle B$.

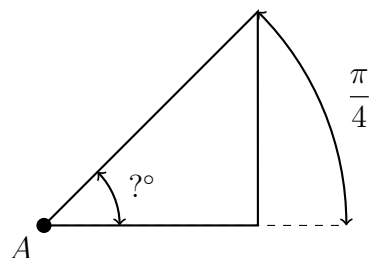
2. Do Now: Convert units of *radians* and *degrees* ($2\pi = 360^\circ$, $\pi = 180^\circ$).

Apply the appropriate formula.

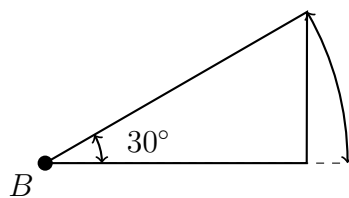
$$d = r \times \frac{180}{\pi}$$

$$r = d \times \frac{\pi}{180}$$

(a) $m\angle A = \frac{\pi}{4} = ? \text{ degrees}$



(b) $m\angle B = 30^\circ = ? \text{ radians}$
(in terms of π)



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

(a) $m = \frac{1}{3}$ $m_{\perp} =$

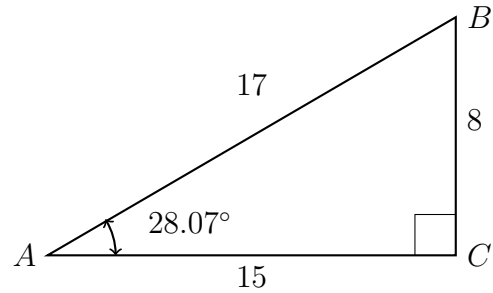
(b) $m = -0.8$ $m_{\perp} =$

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

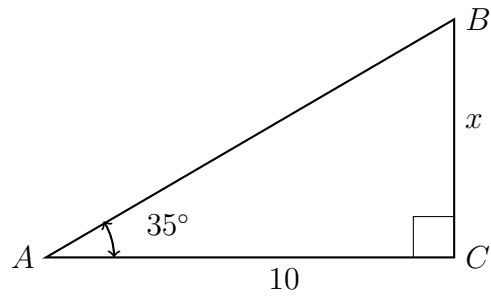


Use Graspable Math to verify the tangent calculation.

(paste two lines below, the substituted values shown and the final equality)

$$\tan 28.07^\circ = \frac{8}{15}$$

5. $\triangle ABC$ is shown with $m\angle C = 90^\circ$, $m\angle A = 35^\circ$, and the base with length $AC = 10$. Find the height $BC = x$.



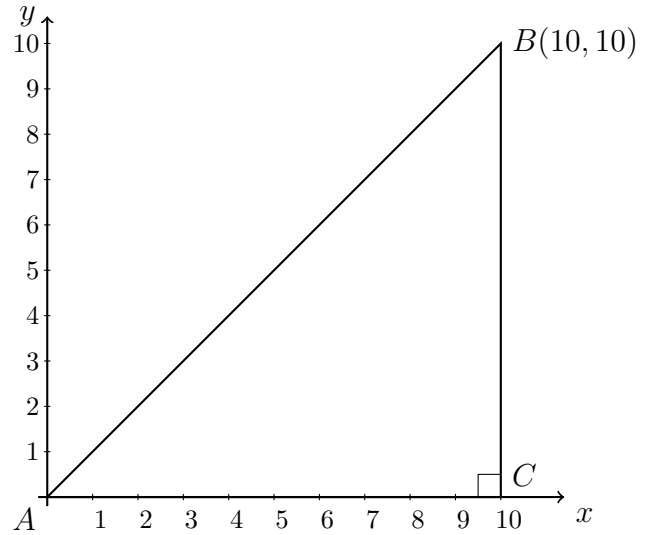
Use Graspable Math and the tangent function: $\tan 35^\circ = \frac{x}{10}$

6. 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)



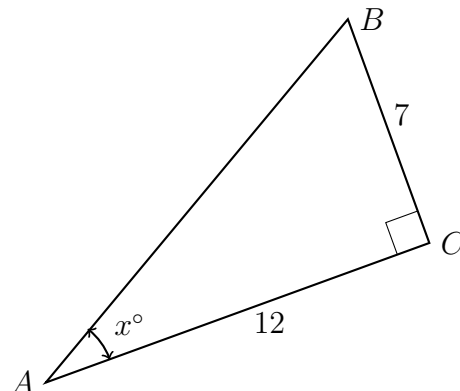
7. $\triangle ABC$ is shown with $m\angle C = 90^\circ$ and $m\angle A = x^\circ$. The lengths of the legs are $AC = 10$ and $BC = 7$.

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

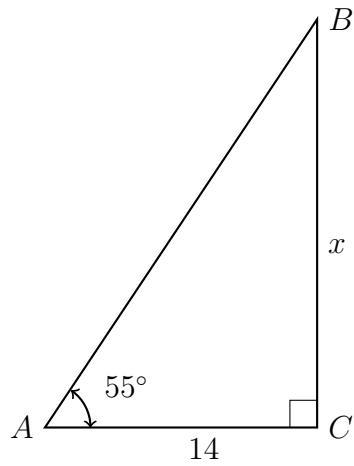
$$\tan x^\circ = \frac{?}{?}$$

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

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



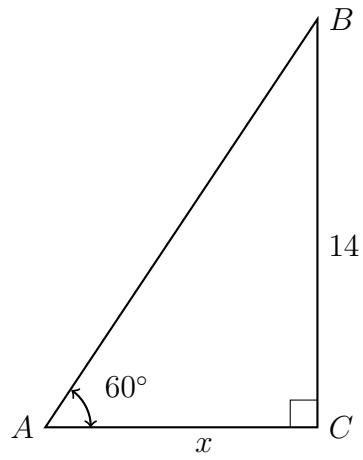
8. $\triangle ABC$ is shown with $m\angle C = 90^\circ$, $m\angle A = 55^\circ$, and the base with length $AC = 14$. Find the height $BC = x$.



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

9. $\triangle ABC$ 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.