9.2 Tangent and slope

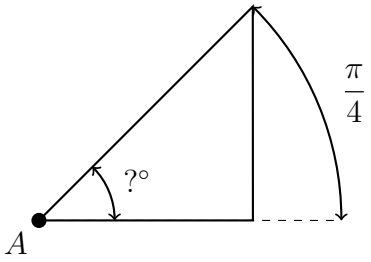
1. Do Now: Given a triangle $\triangle ABC$ having angles with measures $m\angle A = 45°$ and $m\angle C = 90°$. Find the measure of the third angle, $m\angle B$.

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

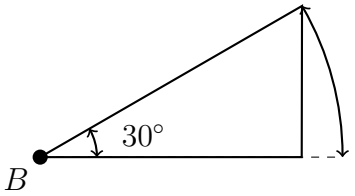
   Apply the appropriate formula.

   $d = r \times \dfrac{180}{\pi}$ $\qquad$ $r = d \times \dfrac{\pi}{180}$

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

   (b) $m\angle B = 30° =$? radians (in terms of π)

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

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

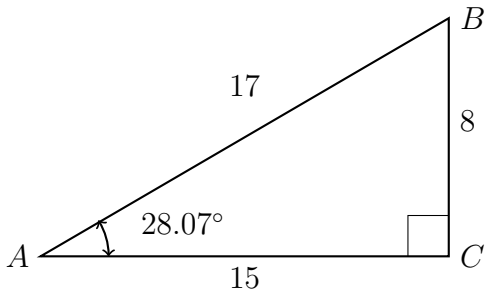
(b) $m = -0.8$ $\quad m_\perp =$

4. $\triangle ABC$ 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* $\angle A$?

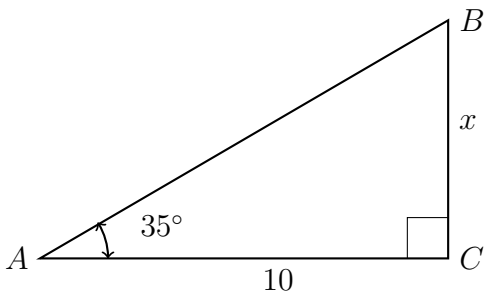
   (c) How long is the side *adjacent* to $\angle A$?



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

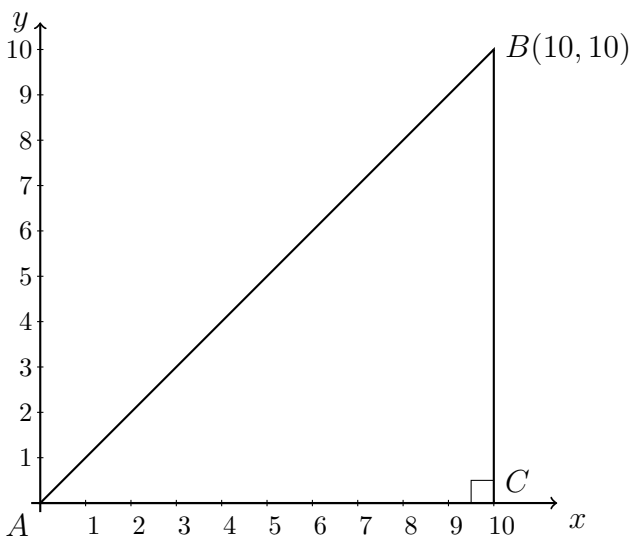
$$\tan 28.07° = \frac{8}{15}$$

5. $\triangle ABC$ 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: $\tan 35° = \dfrac{x}{10}$

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)

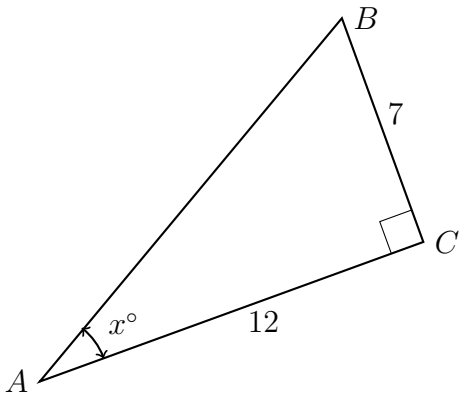
7. $\triangle ABC$ is shown with $m\angle C = 90°$ and $m\angle A = x°$. The lengths of the legs are $AC = 10$ and $BC = 7$.

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

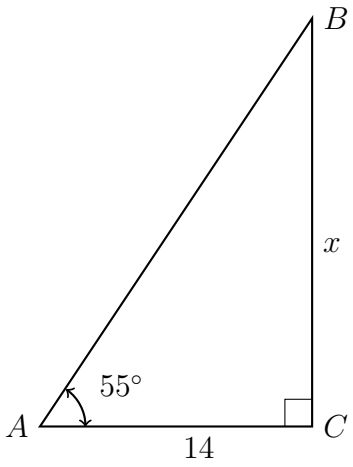
   $\tan x° = \frac{?}{?}$

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

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



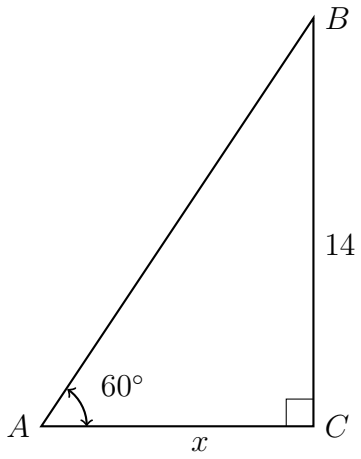
8. $\triangle ABC$ is shown with $m\angle C = 90°$, $m\angle A = 55°$, and the base with length $AC = 14$. Find the height $BC = x$.



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

9. $\triangle ABC$ 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.