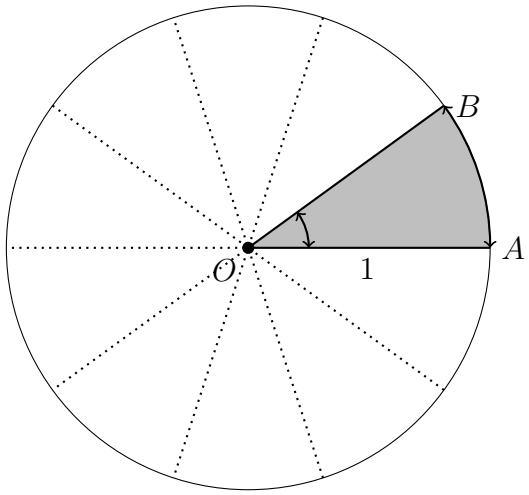
8.2 Sector calculations

1. Do Now: Convert each set of units. One inch $= \frac{1}{12}$ foot or one foot $= 12$ inches.

   (a) How many feet are 30 inches?

   (b) How many inches are 8.25 feet?

2. Do Now: The shaded sector of the unit circle is *one tenth* of the whole circle, as shown.



(a) Write down the circumference in terms of π. ($C = 2\pi r$)

(b) Find $m\angle AOB$ in *degrees*.

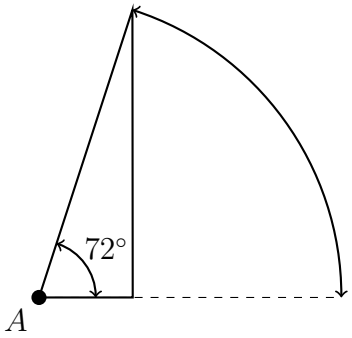
(c) Find $m\angle AOB$ in *radians*.

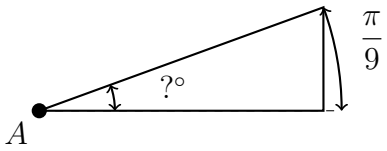
3. Convert equivalent angle measures between *radians* and *degrees* ($2\pi = 360°$, $\pi = 180°$).

   Apply the appropriate formula.

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

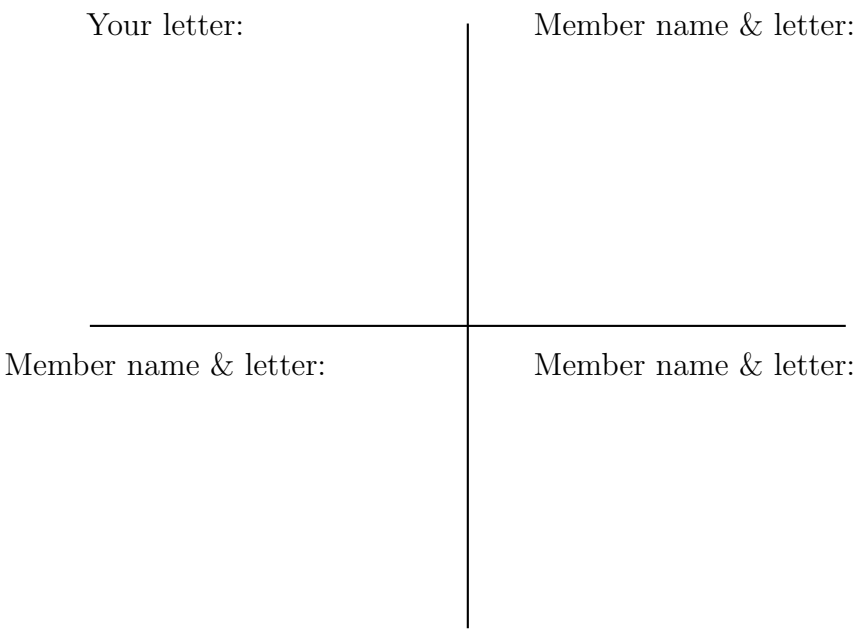
   (a) $72° =$? radians $\qquad$ (b) $\dfrac{\pi}{9} =$? degrees





4. Groupwork: Each member picks a different color and Greek letter. Hand write yours in the upper left quadrant.

   Display screen and copy/paste each team member's name and letter into a different quadrant.



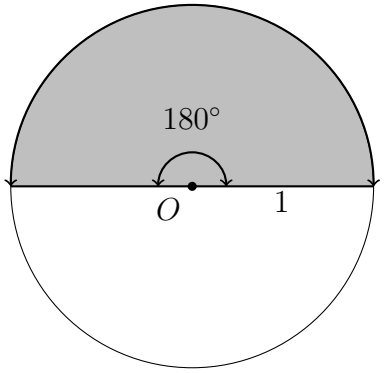
   Example Greek letters are π, θ, α, Δ, β, σ, Σ

   Group order: longest last name to shortest

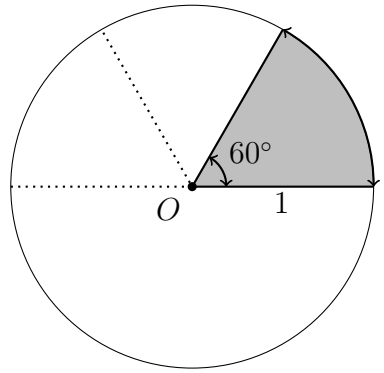
5. Lesson: The length of the arc of a unit circle is a measure of the central angle called *radians*. The circumference of the full circle is $2\pi = 360°$.

   Mark each angle with its radian measure.

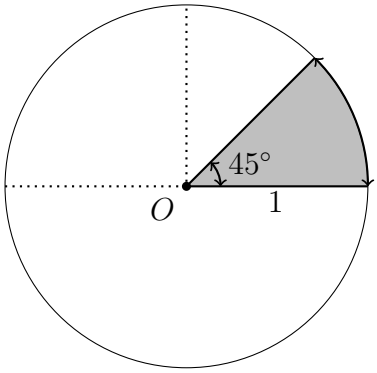
   (a) One half of a circle 180°

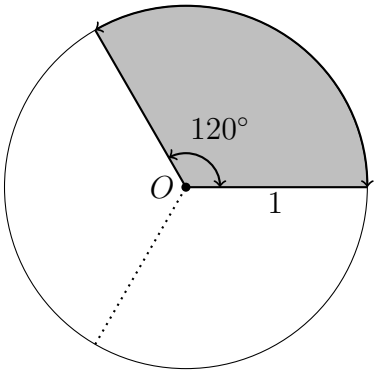
   (b) One sixth of the circle 60°

   (c) One eighth of the circle 45°

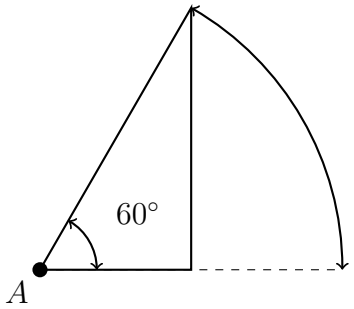
   (d) Two thirds of a circle 180°

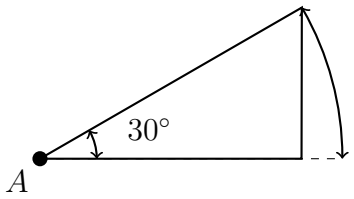
6. Lesson: Algebra view of *radians* to *degrees* using the formula $2\pi = 360°$ or $\pi = 180°$. Apply the appropriate formula.

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

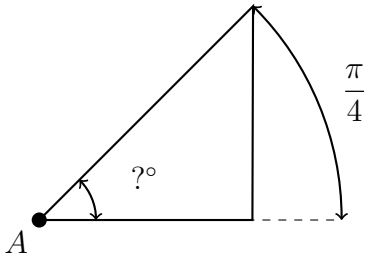
(a) $60° = ?$ radians



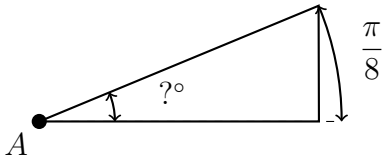
(b) $30° = ?$ radians



(c) $\dfrac{\pi}{4} = ?$ degrees



(d) $\dfrac{\pi}{8} = ?$ degrees



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

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