

## 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?

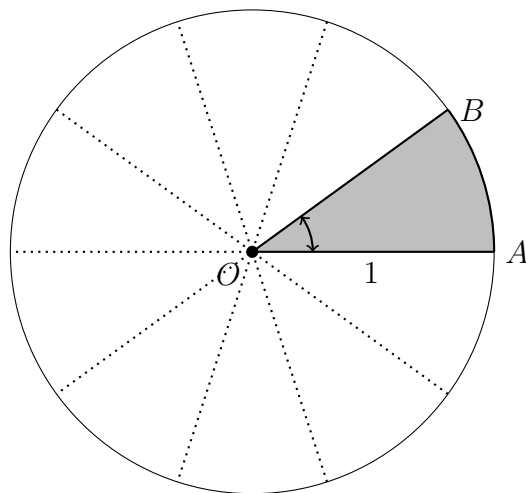
(b) How many inches are 8.25 feet?

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  $\pi$ . ( $C = 2\pi r$ )

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

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



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

Apply the appropriate formula.

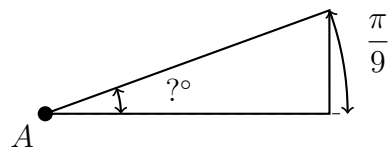
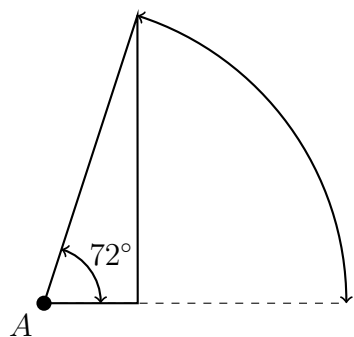
$$r = d \times \frac{\pi}{180}$$

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

- (a)  $72^\circ = ?$  radians

Express in terms of  $\pi$

- (b)  $\frac{\pi}{9} = ?$  degrees



4. Groupwork: Each member picks a different color and Greek letter to write on other members' slides.
  - (a) Hand write yours in the upper left quadrant first.
  - (b) In the breakout room, student with the shortest first name “raises his/her hand” and other members come to “help” him/her.
  - (c) Each student writes his/her name and letter into a different quadrant. (better: copy/paste screenshot)
  - (d) Repeat with each team member.

Your name & letter:	Member name & letter:
Member name & letter:	Member name & letter:

Example Greek letters are  $\pi$ ,  $\theta$ ,  $\alpha$ ,  $\Delta$ ,  $\beta$ ,  $\sigma$ ,  $\Sigma$ ,  $\epsilon$

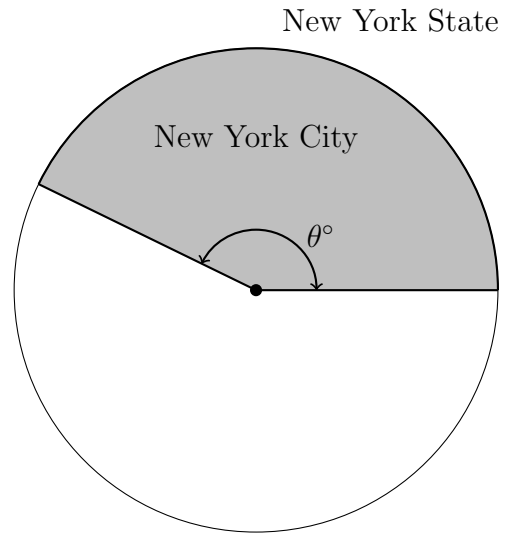
5. Lesson: *Pie charts* represent proportions using sector areas and central angles.

Population of NY City is 8,340,000

Population of NY State is 19,500,000

- (a) Find the fraction of New Yorkers,  $x$ , who reside in NYC as a percentage.

- (b) Find the central angle of the shaded area,  $\theta = x \times 360^\circ$



6. Practice: Convert between *radians* to *degrees* knowing  $2\pi = 360^\circ$  or  $\pi = 180^\circ$ .

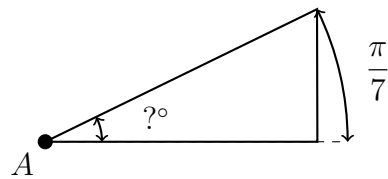
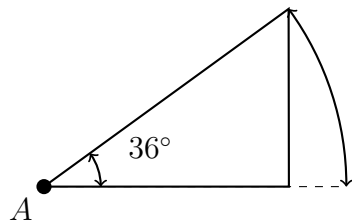
Apply the appropriate formula. Leave radians in terms of  $\pi$ .

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

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

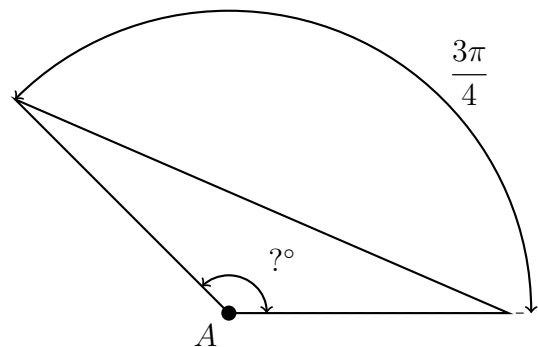
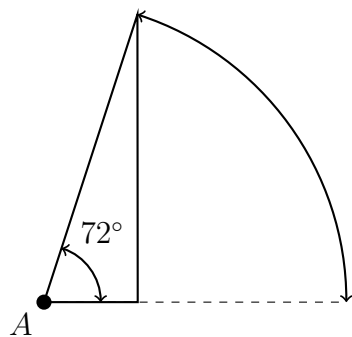
(a)  $36^\circ = ?$  radians

(c)  $\frac{\pi}{7} = ?$  degrees



(b)  $72^\circ = ?$  radians

(d)  $\frac{3\pi}{4} = ?$  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.

