

**13.1 Classwork: Sector calculations**

*Unless otherwise instructed, round final answers to three significant figures.*

**Formulas**

Where  $r$  is the circle's radius,  $D$  its diameter, and  $\theta$  is the sector angle measured in degrees.

$$\text{Circle circumference: } C = \pi D = 2\pi r$$

$$\text{Length of an arc: } l = \frac{\theta}{360} \times 2\pi r$$

$$\text{The area of a circle: } A = \pi r^2$$

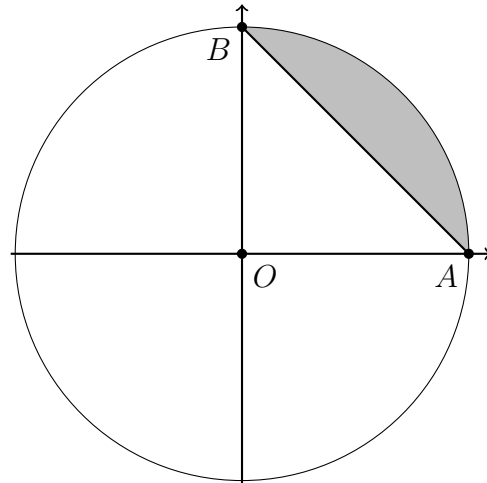
$$\text{Area of a sector: } A = \frac{\theta}{360} \times \pi r^2$$

1. Given the circle  $O$  centered at the origin with radius  $r = 10$  and  $A(10, 0)$ ,  $B(0, 10)$ .

(a) Find the circumference of circle  $O$ .

(b) Find the area of the circle.

(c) Find the length of the arc in the first quadrant (a quarter of the circle).



(d) Find the area of the sector  $AOB$  (quarter circle in the first quadrant).

(e) Find the area of the triangle  $AOB$ .

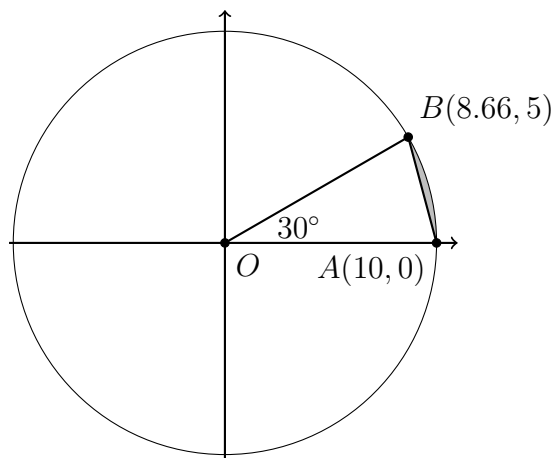
(f) Find the area of the segment  $AB$  of circle  $O$  (shaded area).

2. Sector  $AOB$  of circle  $O$  has a central angle of  $30^\circ$  with  $A(10, 0)$ ,  $B(8.66, 5)$ .

(a) Find the area of the sector  $AOB$ .

(b) Find the area of the triangle  $AOB$ .

(c) Find the area of segment  $AB$  (shaded area).

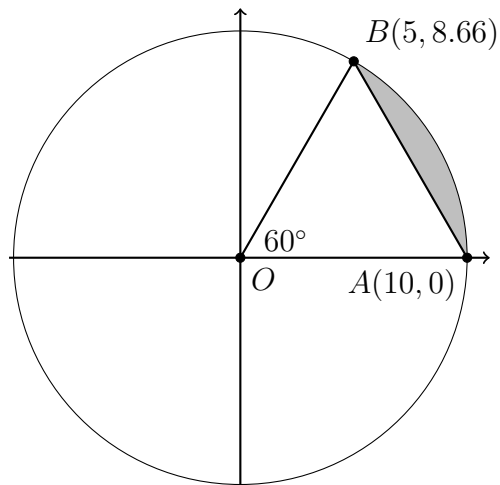


3. Sector  $AOB$  of circle  $O$  has a central angle of  $30^\circ$  with  $A(10, 0)$ ,  $B(5, 8.66)$ .

(a) Find the area of the sector  $AOB$ .

(b) Find the area of the triangle  $AOB$ .

(c) Find the area of segment  $AB$  (shaded area).



4. Calculate the area of a  $45^\circ$  sector and its inscribed triangle and segment, given a radius of 10.