

Intro to Calculus

Workshop 15¹

1. The minute hand of a clock is 10 inches long. How far does the tip of the minute hand travel in 1 hour and 18 minutes?
2. Find each angle between 0 and 2π whose terminal side intersects the unit circle at a point whose x -coordinate is 0.
3. The terminal side of the angle $\frac{4\pi}{5}$ intersects the unit circle approximately at the point $(-0.809, 0.588)$. Include drawings of a unit circle (dia. ≥ 4 cm) as part of your justification.
 - a. Where does the terminal side of the angle $\frac{-4\pi}{5}$ intersect the unit circle?
 - b. Where does the terminal side of the angle $\frac{-\pi}{5}$ intersect the unit circle?
 - c. Find an angle whose terminal side intersects the unit circle at $(0.809, 0.588)$.
 - d. Find an angle whose terminal side intersects the unit circle at $(0.588, 0.809)$.
4. a. Suppose the terminal side of the angle β lies in the second quadrant. In what quadrant do the following lie?
 - a. $\beta + \pi$
 - b. $\beta + \frac{\pi}{2}$
 - c. $-\beta$
 - d. $\beta - 3\pi$
 - e. $\beta - \frac{3\pi}{2}$
 - f. $-\beta + \pi$
 - g. $\frac{\pi}{2} - \beta$
 - h. $-\frac{3\pi}{2} - \beta$
5. a. Find each angle between $-\pi$ and π whose terminal side intersects the unit circle at a point (a, a) , i.e., at a point whose x -coordinate is equal to its y -coordinate.
 - b. Find each angle between $-\pi$ and π whose terminal side intersects the unit circle at a point $(a, -a)$.

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6. Suppose that point A is located on the circumference of $\odot O$ at $(3,4)$. Suppose that point B is the image of point A after the following rotations. What would be the coordinates of point B ?

- a. π b. $-\pi$ c. $\frac{\pi}{2}$ d. $-\frac{3\pi}{2}$ e. $-\frac{41\pi}{2}$

7. Points A and B are located at $\frac{\pi}{3}$ and $\frac{\pi}{6}$ radians (respectively) on the circumference of $\odot O$. Point C is the midpoint of \overline{AB} . Name an angle between π and 2π whose terminal side would coincide with a point of intersection of the line passing through O and C with $\odot O$.

8. Point A is located on the circumference of $\odot O$ at $\frac{\pi}{3}$ radians. Name an angle between $-\pi$ and -2π whose terminal side is coincident with the intersection of the perpendicular bisector of \overline{OA} and $\odot O$.

9. Point A is located on the circumference of $\odot O$ at $\frac{\pi}{6}$ radians. Name an angle between 3π and 4π whose terminal side is coincident with the intersection of the perpendicular bisector of \overline{OA} and $\odot O$.

There are 10 types of people in the world. Those who understand binary and those who don't.

