# Precalculus

## Topic: The Unit Circle

**Instructions**

Solve the following problems related to the Unit Circle. Show all work clearly and check your solutions.

## Practice Problems

1. **Find the terminal point $P(x, y)$ on the unit circle determined by the given value of $t$:**

   (i) $t = \frac{\pi}{3}$
   (ii) $t = \frac{5\pi}{6}$
   (iii) $t = \frac{7\pi}{4}$
   (iv) $t = \frac{\pi}{2}$
   (v) $t = \frac{3\pi}{2}$
   (vi) $t = \frac{5\pi}{3}$
   (vii) $t = \frac{\pi}{4}$
   (viii) $t = \frac{11\pi}{6}$

2. **Suppose that the terminal point determined by $t$ is the point $\left(\frac{3}{5}, \frac{4}{5}\right)$ on the unit circle. Find the terminal point determined by each of the following values of $t$:**

   (a) $t = \pi - t$
   (b) $t = -t$
   (c) $t = \frac{\pi}{2} + t$
   (d) $t = 2\pi + t$

3. **Find the reference number for each value of $t$:**

(i) $t = \frac{5\pi}{6}$

(ii) $t = \frac{2\pi}{3}$

(iii) $t = \frac{4\pi}{3}$

(iv) $t = -\frac{7\pi}{9}$

(v) $t = \frac{\pi}{6}$

(vi) $t = 6$

(vii) $t = -7$

(viii) $t = \frac{5\pi}{4}$

4. **Find (a) the reference number for each value of $t$ and (b) the terminal point determined by $t$.**

(i) $\frac{2\pi}{3}$

(ii) $\frac{3\pi}{4}$

(iii) $\frac{7\pi}{6}$

(iv) $-\frac{11\pi}{3}$

(v) $\frac{31\pi}{6}$

(vi) $-\frac{41\pi}{4}$

# Multiple-Choice Questions

1. For which of the following values of $t$ is the terminal point on the unit circle at $(\frac{1}{2}, \frac{\sqrt{3}}{2})$?

A. $\frac{\pi}{6}$

B. $\frac{\pi}{3}$

C. $\frac{\pi}{4}$

D. $\frac{\pi}{2}$

2. What is the terminal point for $t = \frac{\pi}{4}$ on the unit circle?

A. $(\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}})$

B. $(1, 0)$

C. $(0, 1)$

D. $(-\frac{1}{2}, \frac{\sqrt{3}}{2})$