

MATH 156: Precalculus
Fall 2015
Worksheet §5.1: The Unit Circle

The unit circle in the xy -plane has equation:

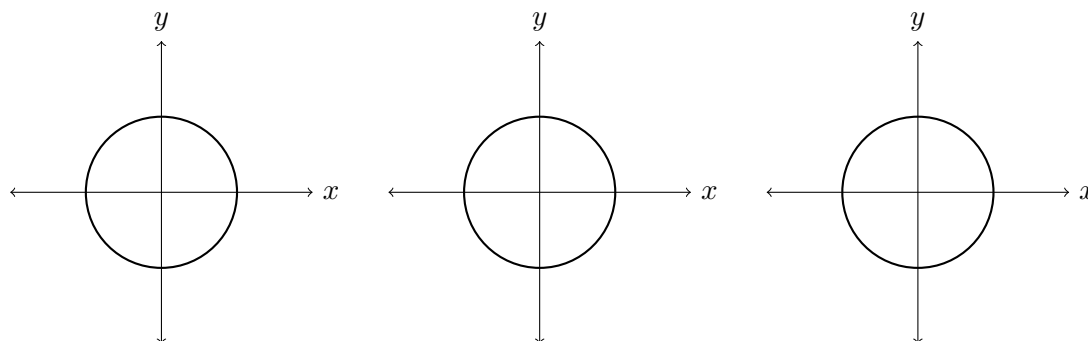
The circumference of the unit circle is:

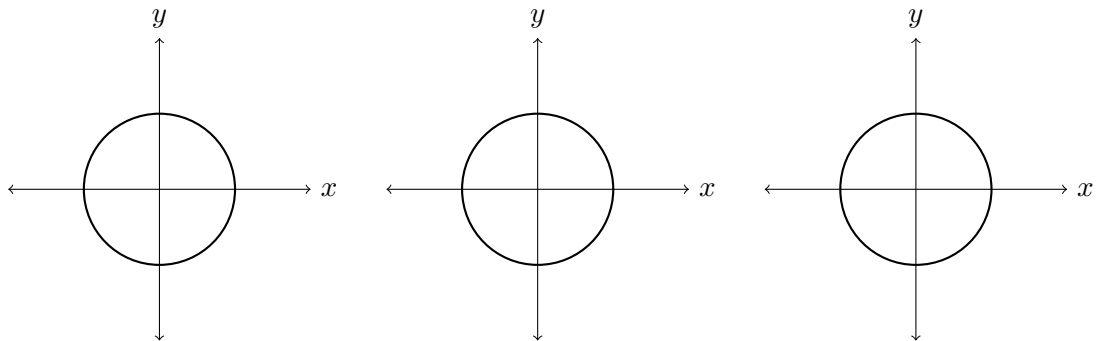
1. Determine which of the following points lie on the unit circle: $P(-\frac{\sqrt{11}}{6}, \frac{5}{6})$, $Q(0, -1)$, $R(\frac{2\sqrt{5}}{5}, \frac{2}{5})$, $S(-\frac{3}{4}, -\frac{2\sqrt{7}}{4})$.

2. Find the missing coordinate of P using the fact that P lies on the unit circle in the given quadrant.
 - (a) $P(1/2, y)$, quadrant IV

 - (b) $P(x, -2/7)$, quadrant III

In our text, t , will always represent a distance along the unit circle starting at $(1, 0)$ in the clockwise direction if $t > 0$ and a counterclockwise direction if $t < 0$.





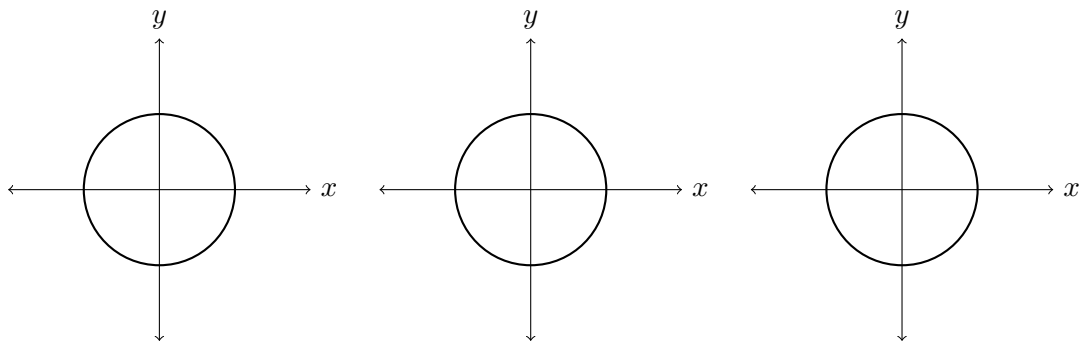
3. Use the unit circles above to draw and label the terminal point determined by the given value of t :
- | | |
|------------------------|------------------------|
| $t = \pi, (x, y) =$ | $t = \pi/2, (x, y) =$ |
| $t = -\pi/2, (x, y) =$ | $t = 0, (x, y) =$ |
| $t = 21\pi, (x, y) =$ | $t = 7\pi/2, (x, y) =$ |
-

Three very special terminal points

$$t = \pi/6$$

$$t = \pi/4$$

$$t = \pi/3$$

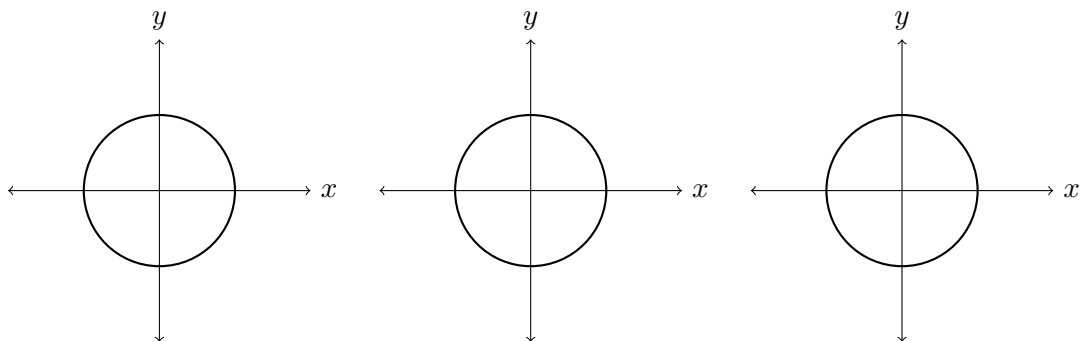


Three more instructive examples

$$t = 3\pi/4$$

$$t = -2\pi/3$$

$$t = 23\pi/6$$



One last definition:

\bar{t} is called the reference number associated with t and is the shortest distance along the unit circle between the terminal point and the x -axis.

4. Find the reference number and terminal point for each value of t .

(a) $t = 5\pi/3$

(b) $t = 7\pi/6$

(c) $t = -7\pi/4$

(d) $t = -17\pi/3$

(e) $t = \pi$

(f) $t = 31\pi/6$

5. Explain what a *radian* is.