4 CORNERS ACTIVITY

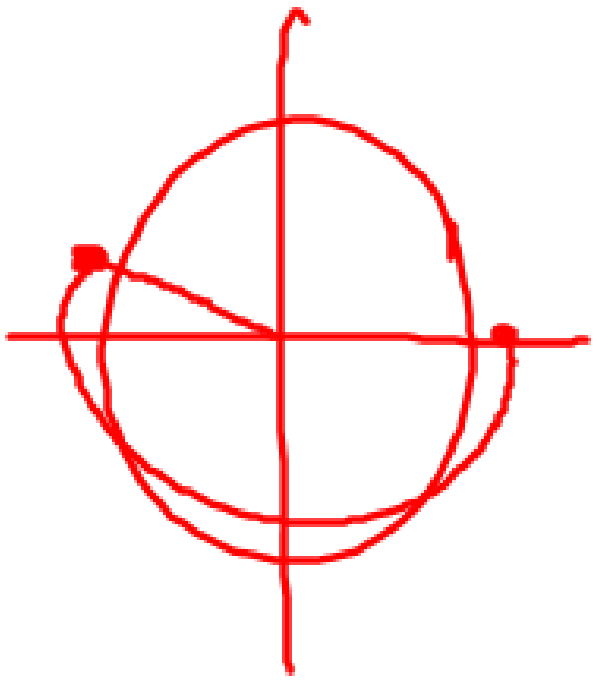
GO TO THE CORNER OF THE ROOM THAT REPRESENTS THE QUADRANT YOUR NUMBER FALLS IN

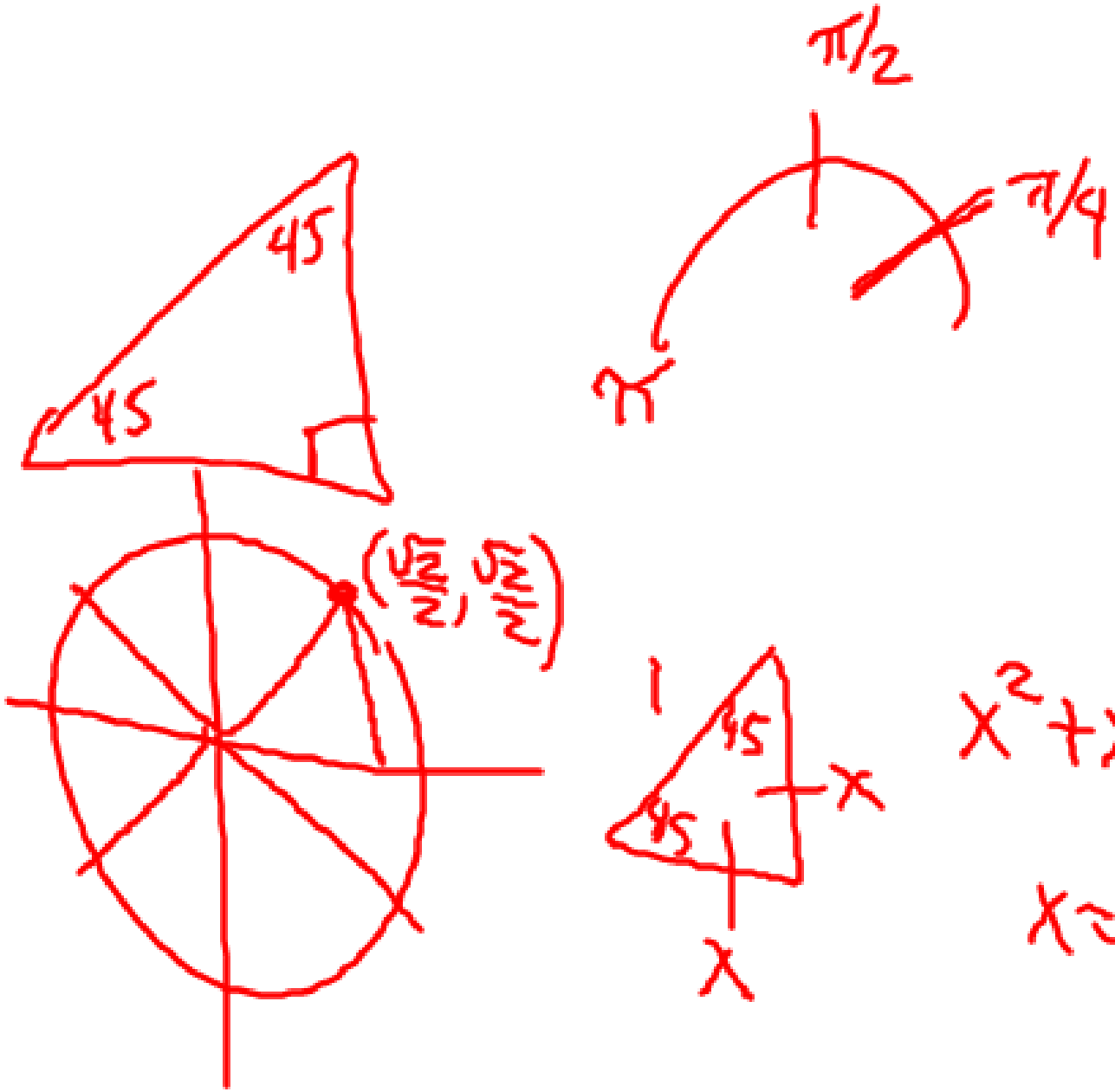
1) $\pi/6$ $-\pi/3$

2) $3\pi/4$ π

3) $7\pi/6$ $\pi/2$

4) $7\pi/4$ $-7\pi/6$





$$x^2 + x^2 = 1$$

$$x = \pm\frac{\sqrt{2}}{2}$$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4. If P(θ) is the point at the intersection of the terminal arm of angle θ and the unit circle, determine the exact coordinates of each of the following.

(x, y)

a) $P(\pi)$ = (−1, 0)

b) $P\left(-\frac{\pi}{2}\right)$

c) $P\left(\frac{\pi}{3}\right)$ $\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$

d) $P\left(-\frac{\pi}{6}\right)$

e) $P\left(\frac{3\pi}{4}\right)$

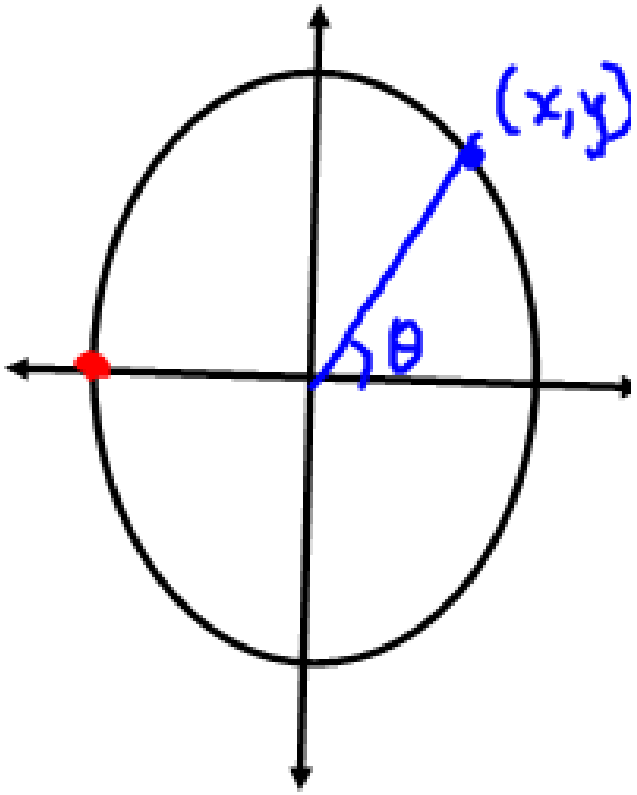
f) $P\left(-\frac{7\pi}{4}\right)$

g) $P(4\pi)$

h) $P\left(\frac{5\pi}{2}\right)$

i) $P\left(\frac{5\pi}{6}\right)$

j) $P\left(-\frac{4\pi}{3}\right)$

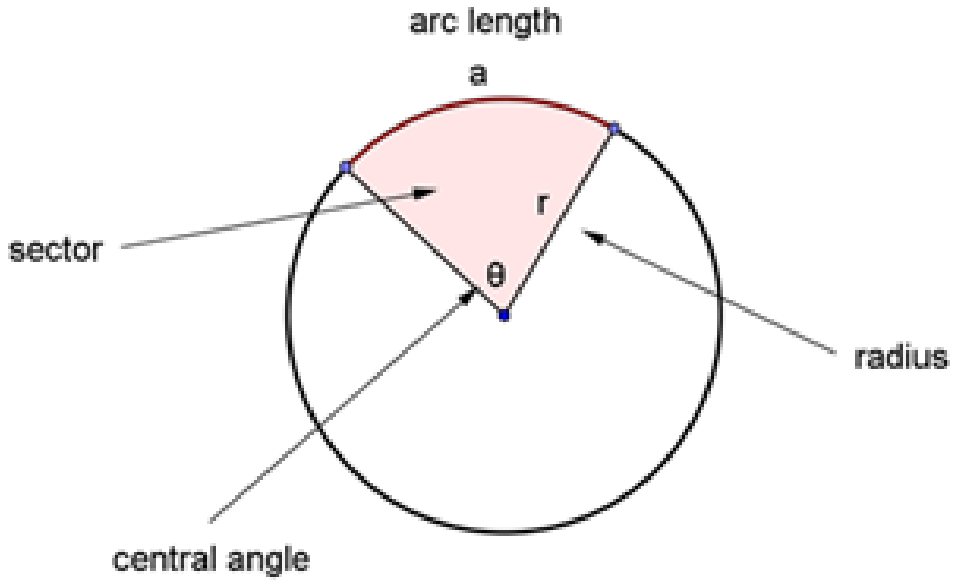


Arc Length of a Circle

$C = 2\pi r$

distance around the circle

angle in a Full circle in radians



The **arc length**, a, of a circle with radius r, subtended by a central angle of θ, is given by:

$$a = (\theta)(r)$$

arc length = (angle in radians) × radius

The angle θ is measured in radians, and a and r must be measured in the same units.

Example: Find the angle of a sector with a radius of 4.3 m and an arc length of 2.95 m

$C = 2\pi r$

$a = \theta r$

$\frac{2.95}{4.3} = \frac{\theta(4.3)}{4.3}$

$0.6860 = \theta$

$\theta = 0.69$ radians

Example: A sector has radius 5 cm and angle 55°. Find its arc length

Change 55° to radians

$$55^\circ \times \frac{\pi}{180^\circ} = \frac{55\pi}{180} = \frac{11\pi}{36}$$

$s = \theta r$

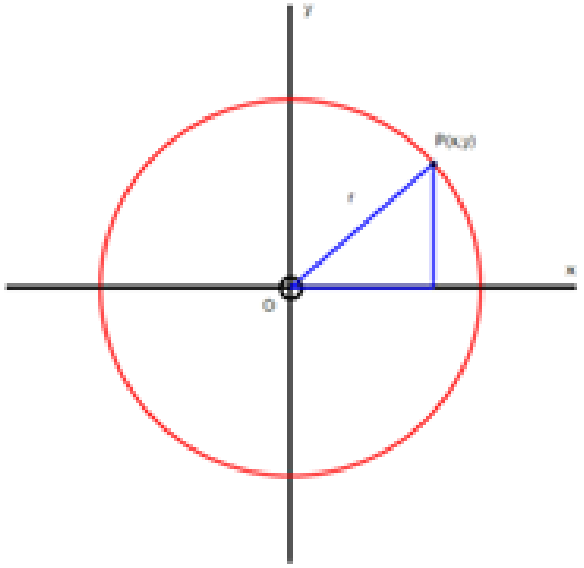
$s = \frac{11\pi}{36} \cdot 5$

$s = \frac{55\pi}{36}$ cm

The equation of any circle, radius r, with centre at the origin is:

$x^2 + y^2 = r^2$

$x^2+y^2=r^2$



Example: Determine the equation of a circle with centre at the origin and radius 5.

$x^2+y^2=5^2$

$x^2+y^2=25$

Pg. 183

Your Turn

Determine the missing coordinate(s) for all points on the unit circle satisfying the given conditions. Draw a diagram and tell which quadrant(s) the points lie in.

a) $\left(-\frac{5}{8}, y\right)$

Q II and Q III

$x^2+y^2=r^2$

$\left(-\frac{5}{8}\right)^2+y^2=1^2$

$\frac{25}{64}+y^2=1$

$y^2=1-\frac{25}{64}$

$y^2=\frac{64}{64}-\frac{25}{64}$

$y^2=\frac{39}{64}$

$y=\pm\sqrt{\frac{39}{64}}$

$y=\pm\frac{\sqrt{39}}{8}$

Pg. 183

Your Turn

Determine the missing coordinate(s) for all points on the unit circle satisfying the given conditions. Draw a diagram and tell which quadrant(s) the points lie in.

b) $\left(x, \frac{5}{13}\right)$, where the point is in quadrant II

$$x^2 + \left(\frac{5}{13}\right)^2 = 1^2$$

$$x^2 + \frac{25}{169} = 1$$

$$x^2 = 1 - \frac{25}{169}$$

$$x^2 = \frac{169}{169} - \frac{25}{169}$$

$$x^2 = \frac{144}{169}$$

$$x = \pm\sqrt{\frac{144}{169}}$$

$$x = \pm\frac{12}{13}$$

$x = -12/13$ because in QII

HW:

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HW: Pg 176 #12, 13, 16, 17

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