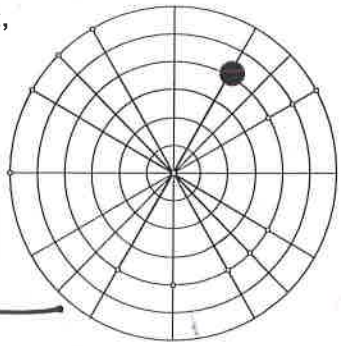
Key

Precalculus –Unit 9 Additional Review

1. Give at least 8 ways to represent the point on the graph to the right, using positives and negatives, radians and degrees.



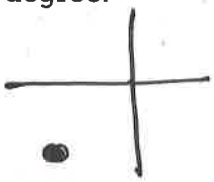
Degrees:		Radians:	
$(+,+)$ $(4,60)$	$(-,+)$ $(-4,240°)$	$(4,\frac{\pi}{3})$	$(-4,\frac{4\pi}{3})$
$(4,-300°)$ $(+,-)$	$(-4,-120°)$ $(-,-)$	$(4,-\frac{5\pi}{3})$	$(-4,-\frac{2\pi}{3})$

2. Convert the following rectangular coordinates into polar coordinates. Include a graph. Leave r as an exact value (no decimals) but approximate θ to the nearest degree.

a. $(-3,6)$

Same as #3B on the original review.

b. $(-1,-9)$



$r = \sqrt{1+81}$

$r = \sqrt{82}$

$\theta = \tan\left(\frac{-9}{-1}\right)$

$\theta = 0.16°$

$(-\sqrt{82}, 0.16°)$

3. Convert the following polar coordinates into rectangular coordinates. Include a graph. Leave x and y as exact values (no decimals).

a. $(-2, \pi/4)$

$(-\sqrt{2}, -\sqrt{2})$

$x = r\cdot\cos\theta$

$= -2\cdot\cos\frac{\pi}{4}$

$= -2\cdot\frac{\sqrt{2}}{2}$

$= -\sqrt{2}$

$y = r\cdot\sin\theta$

$= -2\cdot\frac{\sqrt{2}}{2}$

$= -\sqrt{2}$

b. $\left(5, \frac{5\pi}{6}\right)$

$\left(-\frac{5\sqrt{3}}{2}, \frac{5}{2}\right)$

$x = r\cdot\cos\frac{5\pi}{6}$

$= 5\cdot\frac{-\sqrt{3}}{2}$

$= -\frac{5\sqrt{3}}{2}$

$y = r\cdot\sin\frac{5\pi}{6}$

$= 5\cdot\frac{1}{2}$

$= \frac{5}{2}$

4. Convert the following polar coordinates into rectangular coordinates. Include a graph. Round to the nearest thousandth. 3 decimal places

a. $(10, -100°)$

$x = 10 \cdot \cos(-100°)$ | $y = 10 \cdot \sin(-100°)$

$x = -1.736$ | $y = -9.848$

$(-1.736, -9.848)$

b. $(17, 331.928°)$

$x = 17 \cdot \cos(331.928°)$ | $y = 17 \sin(331.928°)$

$x = 15$ | $y = -8$

$(15, -8)$

5. Convert the following equations from rectangular to polar. Solve for r if possible.

a. $x = -10$

$r \cdot \cos\theta = -10$

$r = \frac{-10}{\cos\theta}$

$r = -10 \cdot \frac{1}{\cos\theta}$

$r = -10 \cdot \sec\theta$

b. $x^2 + y^2 - 5x = 0$

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

$r^2 = 5(r \cdot \cos\theta)$

$r = 5\cos\theta$

6. Convert the following equations from polar to rectangular:

a. $r = \frac{3}{2}$

$\left(\sqrt{x^2+y^2}\right)^2 = \left(\frac{3}{2}\right)^2$

$x^2 + y^2 = \frac{9}{4}$

b. $r = 12\sin\theta$

$r = 12\left(\frac{y}{r}\right)$

$r^2 = 12y$

$x^2 + y^2 = 12y$

$x^2 + y^2 - 12y + 36 = 0 + 36$

$x^2 + (y-6)^2 = 36$