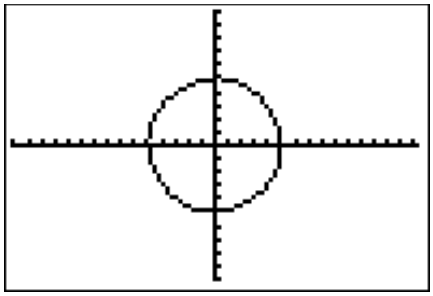
MAH Polar
Transitions WS

Name:
Period:

1. Consider the graph at the right.

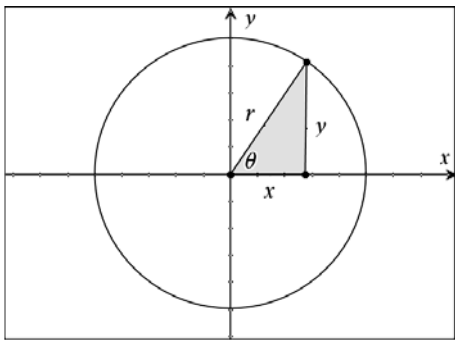


a. What rectangular equation could be used to represent the graph?

b. What polar equation could be used to represent the graph?

2.

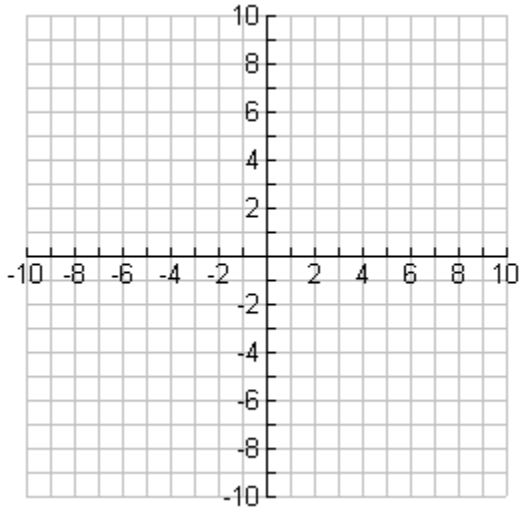
It's helpful to remember that $x^2 + y^2 = r^2$. This is a link between the two equation forms. Look over the diagram to the right.



Using the diagram, identify 3 basic equations useful in converting rectangular equations to polar form. Substitution is a useful tool in this process.

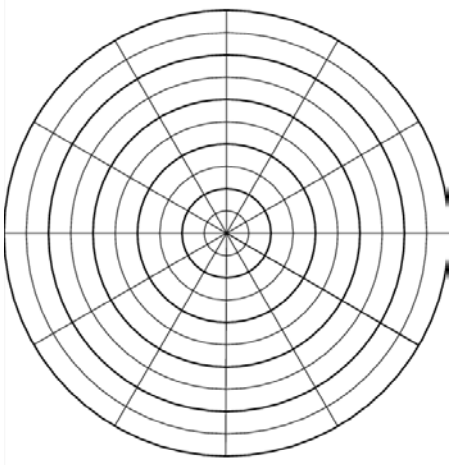
3. a. Graph the circle with rectangular equation

$$x^2 + (y-4)^2 = 16$$



b. By substituting the basic identities from question 2, convert the equation to a polar equation, and solve for r in terms of θ .

c. Graph the polar equation on your calculator:



4. a. Graph the polar equation $r = \frac{2}{\cos(\theta+\pi)}$ on your calculator. Describe the graph.

b. If you were told this was the graph of a rectangular equation, what would you determine the equation to be?

c. Show that your answer in b is correct by converting the polar equation to rectangular. (Hint: multiply both sides by the denominator, then use the cosine sum identity)

5. Write the polar form of each of the following equations:

a. $x^2 + y^2 = 64$ **b.** $(x-2)^2 + y^2 = 4$

c. $x = -5$ **d.** $x^2 - y^2 = 1$

6. Write the rectangular form of each of the following polar equations.

a. $r = 3$ **b.** $r = 3\sin\theta$ (hint: multiply each side by r first)

c. $6 = \mathrm{r}\cos\left(\theta - \frac{\pi}{4}\right)$ **d.** $r = 3\sec(\theta + 60°)$

Write the polar from of each of the following linear equations: (Graph to check your answers)

a. $x = 0$ b. $y = 0$ c. $x = 3$

d. $y = -2$ e. $y = x$ f. $y = 2x$

g. $y = -\frac{1}{3}x$ h. $y = 4x - 1$ i. $y = -\frac{1}{2}x + 6$