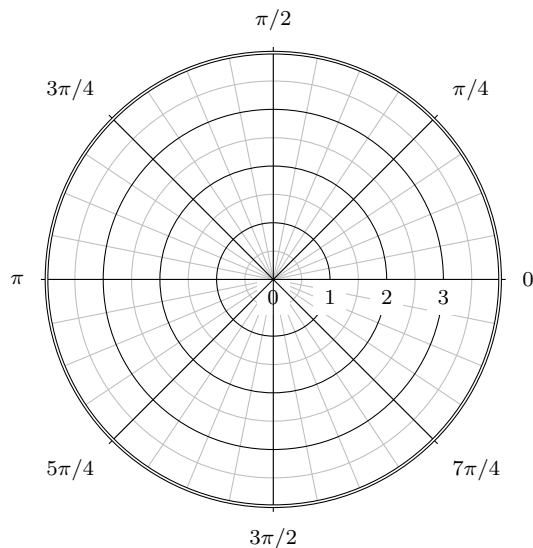1. Plot the following points on the grid at right:

   (a) $(r, \theta) = (2, 2\pi/3)$

   (b) $(r, \theta) = (4, 3\pi/2)$

   (c) $(r, \theta) = (-3, 3\pi/4)$

   (d) $(r, \theta) = (0, 11\pi/6)$

2. We need a way to translate between polar coordinates and rectangular coordinates. Suppose the polar coordinate (r, θ) and the rectangular coordinate (x, y) correspond to the same location in the plane.

   (a) Using trigonometry, we have the formula

   $$\frac{x}{r} = \cos(\theta).$$

   Write down a similar formula correpsonding to y.

   (b) Solve the formulas above for x and y, respectively. Now you have a way to covert polar coordinates to rectangular coordinates!

   (c) On the other hand, can you find two formulas that will help you solve for r and θ?

   (d) Solve your formulas for r and θ and you'll have a way to convert rectangular coordinates to polar coordinates! (It's okay if your formula for θ depends on which quadrant the point is in.)

3. Convert $(r, \theta) = (2, 2\pi/3)$ into rectangular coordinates.

4. Convert $(x, y) = (-5, -5\sqrt{3})$ into polar coordinates.

5. Convert $r = 2$ into rectangular coordinates. What shape is this curve?

6. Convert $r = 3\cos(\theta)$ into rectangular coordinates.