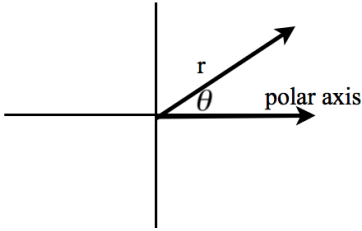


# Chapter 13

## Section 13.2 Polar Coordinates

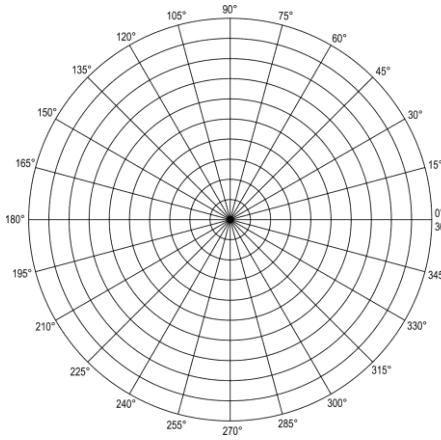


$(r, \theta)$  polar coordinates can be degree or radian

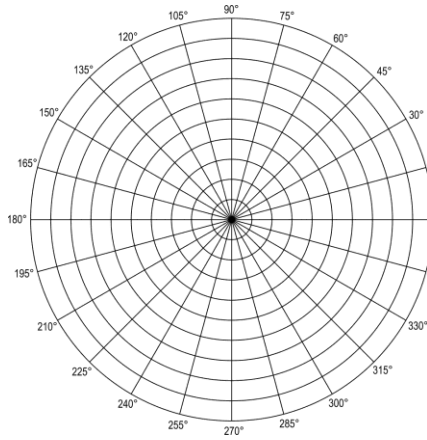
The **pole** is in the center where  $(0, 0)$  usually is.

Plot the following polar coordinates.

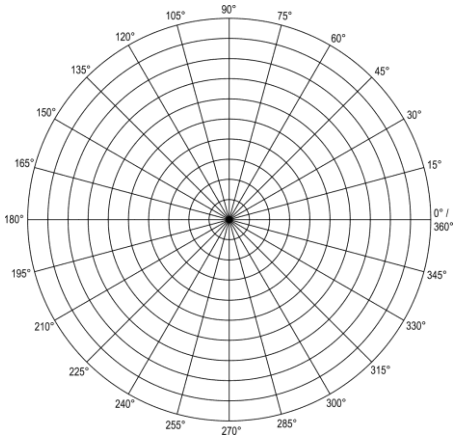
1.  $(6, 45^\circ)$



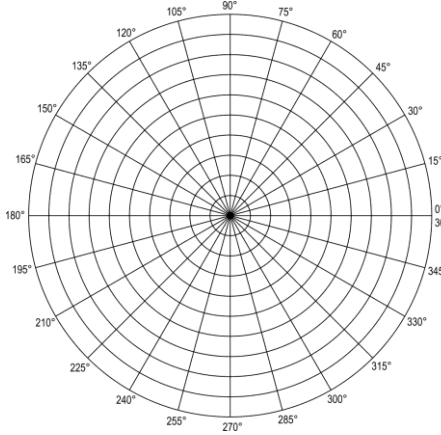
2.  $(6, 405^\circ)$



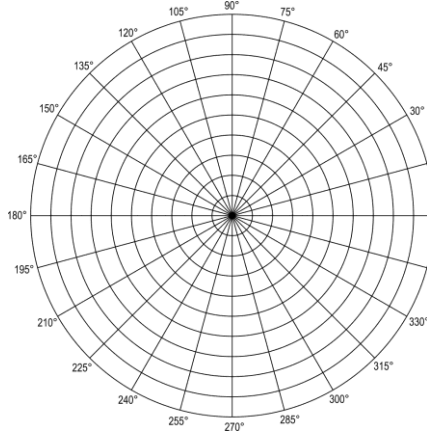
3.  $(-6, 225^\circ)$



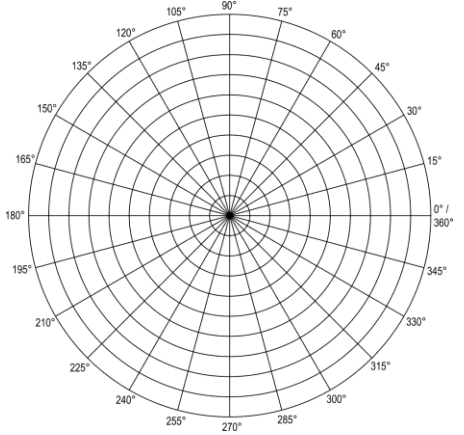
4.  $(4, 300^\circ)$



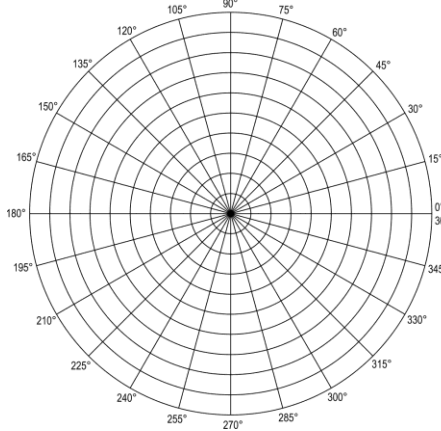
5.  $(3, 0^\circ)$



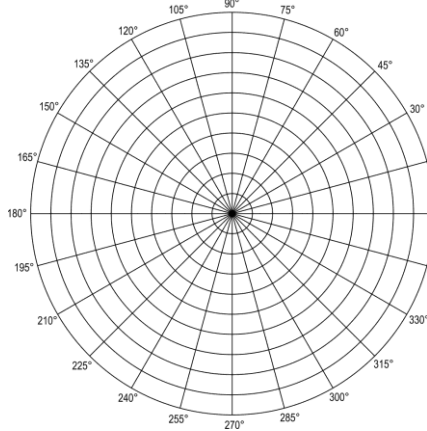
6.  $(-8, 45^\circ)$



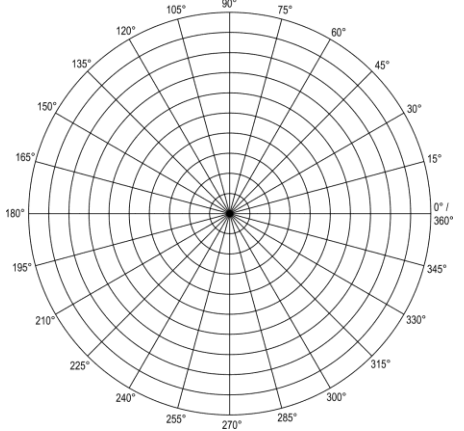
7.  $(5, 270^\circ)$



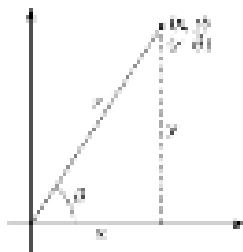
8.  $(-3, 120^\circ)$



9.  $(-7, -75^\circ)$



## Converting from Polar Coordinates to Rectangular Coordinates



$$(r, \theta)$$

$$\theta = \tan^{-1} \frac{y}{x}$$

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

$$\cos \theta = \frac{x}{r}$$

$$\sin \theta = \frac{y}{r}$$

The polar coordinates are given. Find the rectangular coordinates.

10.  $(4, 270^\circ)$

11.  $(-2, 60^\circ)$

12.  $(6, 30^\circ)$

13.  $(-4, -45^\circ)$

## Converting from Rectangular to Polar Coordinates

(Plot the point to see what quadrant. Find  $r$ . Then use inverse tangent of point to find the angle.)

14.  $(0, 3)$

15.  $(-4, 0)$

16.  $(2, -2)$

17.  $(-1, -\sqrt{3})$