

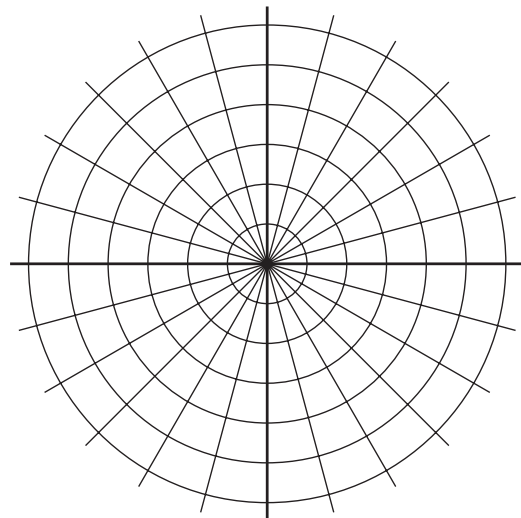
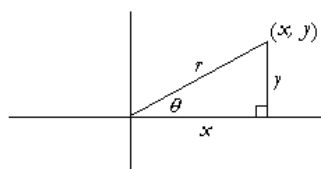
Aim: How do we convert between polar and rectangular coordinates?**I. Do Now:**

Given the polar coordinates of each point

- (a) Plot the point on the polar plane to the right.
 (b) State four different pairs of polar coordinates that represent the given point.

1. $(4, \pi)$ or $(4, 180^\circ)$

2. $(\sqrt{3}, \frac{\pi}{6})$ or $(\sqrt{3}, 30^\circ)$

Note that $\sqrt{3} \approx 1.7$.**II. Given the rectangular coordinates (x, y) as shown in the diagram below, find:**

(a) $\cos \theta =$

(d) Write an equation that relates x , y , and r .

(b) $\sin \theta =$

(c) $\tan \theta =$

$\theta =$ if $x > 0$

$\theta =$ if $x < 0$

III. Use the formulas in the boxes above to perform the following conversions.(When converting to polar form, use a value of θ such that $0 \leq \theta < 2\pi$.)

3. $(6, \pi)$ to rectangular form 4. $(\sqrt{3}, \frac{\pi}{3})$ to rectangular form 5. $(-2, \frac{5\pi}{6})$ to rectangular form

6. $(1, 1)$ to polar form

7. $(0, 2)$ to polar form

8. $(-4\sqrt{3}, -4)$ to polar form

9. $(-2\sqrt{3}, 6)$ to polar form

10. $(5\sqrt{2}, -5\sqrt{2})$ to polar form

*11. $(0, 0)$ to polar form

(if time)

12. Find another set of polar coordinates for each of the points in problems 6 – 10.

HW35

- Read pages 802 – 803.
- p. 805: 3, 4, 7, 10, 17, 18, 21, 22, 31, 32 (use polar graph paper for #7 and #10)
- p. 432: 31
- p. 518: 3, 7, 8b