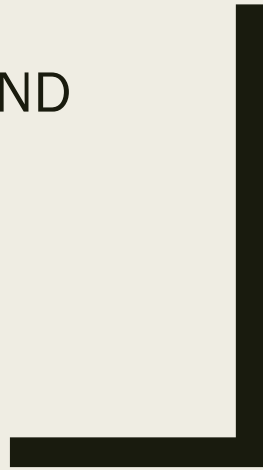
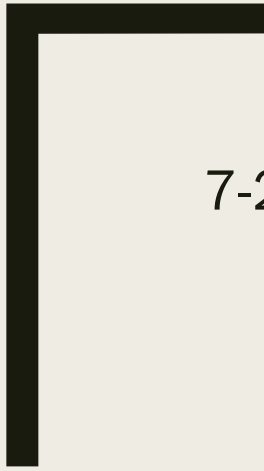


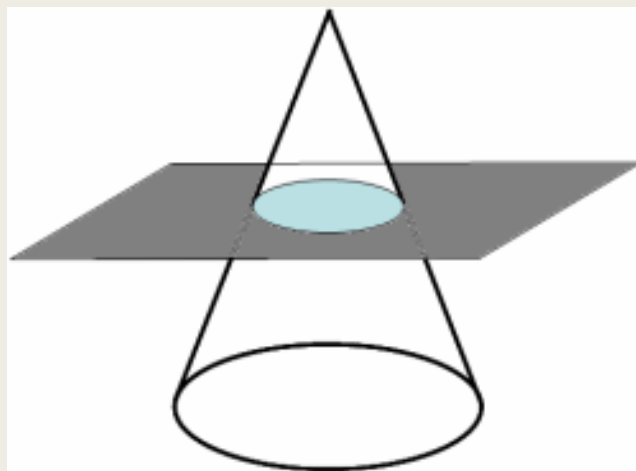
7-2: CIRCLES AND ELLIPSES

CIRCLES

CP Precalculus
Mr. Gallo



Slice a cone with a plane parallel to the base to get a circle.



Circles

Circle – the set of all points at a given distance from a central point

CENTER = (h, k) RADIUS = r

Equation for circles:

$$r^2 = (x - h)^2 + (y - k)^2$$

h, k, r are all NUMBERS

x, y are VARIABLES

Given the equation $x^2 + y^2 = 49$:

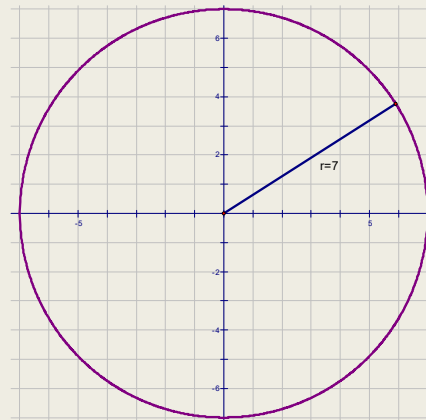
- What is the center?

$(0, 0)$

- What is the radius?

$\sqrt{49} = \pm 7$ Answer: $r = 7$

- Sketch it.



Given the equation $(x - 4)^2 + (y + 3)^2 = 9$:

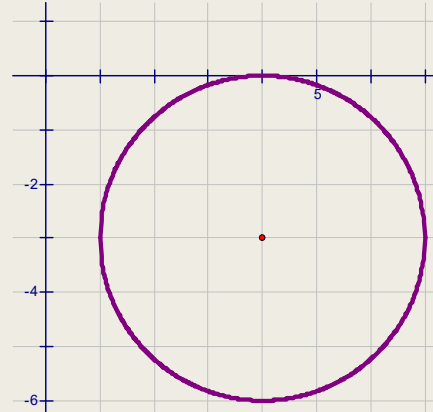
- What is the center?

$(4, -3)$

- What is the radius?

$\sqrt{9} = \pm 3$ Answer: $r = 3$

- Sketch it.



Given the equation $(x + 2)^2 + (y - 2)^2 \leq 9$:

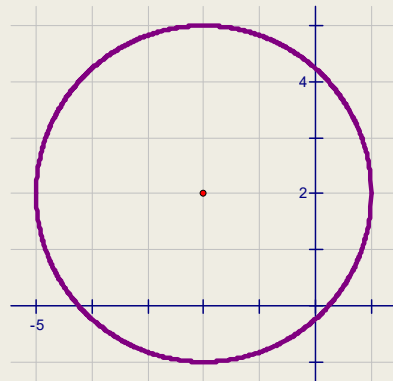
- What is the center?

$(-2, 2)$

- What is the radius?

$\sqrt{9} = \pm 3$ Answer: $r = 3$

- Sketch it.



Given a circle with center at (0, -1) and a radius of 1. Write a *simplified* equation for the circle.

- $h = \underline{0}$ $1 = (x-0)^2 + (y-(-1))^2$
- $k = \underline{-1}$ $1 = x^2 + (y+1)^2$
- $r^2 = \underline{1^2 = 1}$

Write the equation for a circle with a center at (1,2) and containing the point (3,4).

- $(h, k) = (1, 2)$ $r^2 = (3-1)^2 + (4-2)^2$
- $(x, y) = (3, 4)$ $r^2 = 4 + 4 = 8$
- $8 = (x-1)^2 + (y-2)^2$

Given the equation of a circle $x^2 - 6x + 3y + y^2 - 6 = 0$:

■ What is the center?

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

■ What is the radius?

Complete the square to find the square binomials.

$$r = \frac{\sqrt{69}}{2}$$

$$x^2 - 6x + 3y + y^2 - 6 = 0$$

$$x^2 - 6x + 3^2 + y^2 + 3y + \left(\frac{3}{2}\right)^2 = 6 + 9 + \frac{9}{4}$$

$$(x-3)^2 + \left(y + \frac{3}{2}\right)^2 = \frac{69}{4}$$

For the equation $x^2 + y^2 - 4x - 32 = 0$:

- Find the radius.

$$r = \sqrt{36} = 6$$

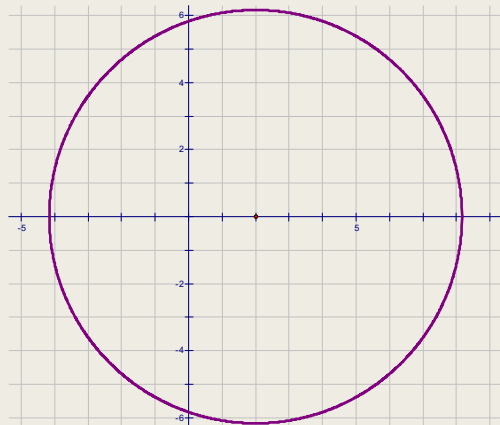
$$x^2 - 4x + 2^2 + y^2 = 32 + 4$$

- Find the center.

$$(2, 0)$$

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

- Sketch it.



Homework: 7-2 Circles and Ellipses Circles Homework WS