

# Circles – Completing Circle Squares

G.GPE.A.1

Notes Section 11.5

Name \_\_\_\_\_

Standard equation of a circle: In general, an equation for a circle with center at  $(h, k)$  and a radius of  $r$  units is

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

Identify the center and radius, then graph each circle.

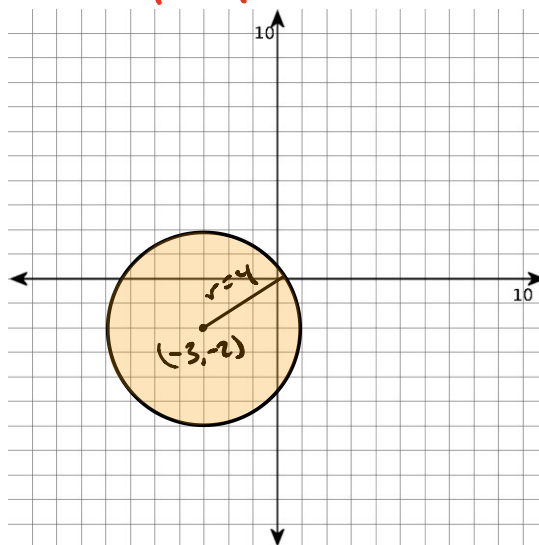
#1)  $x^2 - 6x + y^2 + 4y - 3 = 0$

$$(x^2 - 6x + 9) + (y^2 + 4y + 4) = 3 + 9 + 4$$

$$(x - 3)^2 + (y + 2)^2 = 16$$

$$C = (-3, -2)$$

$$r = 4$$



Write each equation of a circle in standard form by completing some squares. Identify the center and radius.

#1)  $x^2 - 6x + y^2 - 2y - 8 = 0$

$$(x^2 - 6x + 9) + (y^2 - 2y + 1) = 8 + 9 + 1$$

$$(x - 3)^2 + (y - 1)^2 = 18$$

$$C = (3, 1)$$

$$r = \sqrt{18} = 3\sqrt{2}$$

#2)  $x^2 - 8x + y^2 + 10y = 10$

$$(x^2 - 8x + 16) + (y^2 + 10y + 25) = 10 + 16 + 25$$

$$(x - 4)^2 + (y + 5)^2 = 51$$

$$C = (4, -5)$$

$$r = \sqrt{51}$$

#2)  $x^2 + 16x + y^2 + 12y = -91$

$$(x^2 + 16x + 64) + (y^2 + 12y + 36) = -91 + 64 + 36$$

$$(x + 8)^2 + (y + 6)^2 = 9$$

$$C = (-8, -6)$$

$$r = 3$$

