

Circles – Completing Circle Squares

G.GPE.A.1

Hw Section 11.5

Name _____

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

#1) $x^2 + 4x + y^2 - 16y + 52 = 0$

$$(x^2 + 4x + 4) + (y^2 - 16y + 64) = -52 + 4 + 64$$

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

$$C = (-2, 8)$$

$$r = 4$$

#2) $x^2 + 2x + y^2 + 18y = -1$

$$(x^2 + 2x + 1) + (y^2 + 18y + 81) = -1 + 1 + 81$$

$$(x+1)^2 + (y+9)^2 = 81$$

$$C = (-1, -9)$$

$$r = 9$$

#3) $x^2 + 10x + y^2 - 16 = 0$

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

$$(x+5)^2 + y^2 = 41$$

$$C = (-5, 0)$$

$$r = \sqrt{41}$$

#4) $x^2 - 14x + y^2 - 2y = 50$

$$(x^2 - 14x + 49) + (y^2 - 2y + 1) = 50 + 49 + 1$$

$$(x-7)^2 + (y-1)^2 = 100$$

$$C = (7, 1)$$

$$r = 10$$

#5) $x^2 + 18x + y^2 + 17 = 0$

$$(x^2 + 18x + 81) + y^2 = -17 + 81$$

$$(x+9)^2 + y^2 = 64$$

$$C = (-9, 0)$$

$$r = 8$$

#6) $x^2 - 10x + y^2 + 10y = -48$

$$(x^2 - 10x + 25) + (y^2 + 10y + 25) = -48 + 25 + 25$$

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

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

$$r = \sqrt{2}$$

#7) $x^2 - 6x + y^2 - 18 = 0$

$$(x^2 - 6x + 9) + y^2 = 18 + 9$$

$$(x-3)^2 + y^2 = 27$$

$$C = (3, 0)$$

$$r = \sqrt{27} = 3\sqrt{3}$$

#8) $x^2 - 14x + y^2 - 2y = 50$

$$(x^2 - 14x + 49) + (y^2 - 2y + 1) = 50 + 49 + 1$$

$$(x-7)^2 + (y-1)^2 = 100$$

$$C = (7, 1)$$

$$r = 10$$

#9) $x^2 + 9x + y^2 + 4y = \frac{3}{4}$

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

$$(x + \frac{9}{2})^2 + (y+2)^2 = \frac{3}{4} + \frac{81}{4} + \frac{16}{4}$$

$$(x + \frac{9}{2})^2 + (y+2)^2 = \frac{100}{4}$$

$$(x + \frac{9}{2})^2 + (y+2)^2 = 25$$

$$C = (-\frac{9}{2}, -2) \quad r = 5$$

#10) $x^2 + 5x + y^2 + 3y = \frac{3}{4}$

$$(x^2 + 5x + (\frac{5}{2})^2) + (y^2 + 3y + (\frac{3}{2})^2) = \frac{3}{4} + (\frac{5}{2})^2 + (\frac{3}{2})^2$$

$$(x + \frac{5}{2})^2 + (y + \frac{3}{2})^2 = \frac{6}{4} + \frac{25}{4} + \frac{9}{4}$$

$$(x + \frac{5}{2})^2 + (y + \frac{3}{2})^2 = \frac{40}{4}$$

$$(x + \frac{5}{2})^2 + (y + \frac{3}{2})^2 = 10$$

$$C = (-\frac{5}{2}, -\frac{3}{2})$$

$$r = \sqrt{10}$$

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Graph each circle.

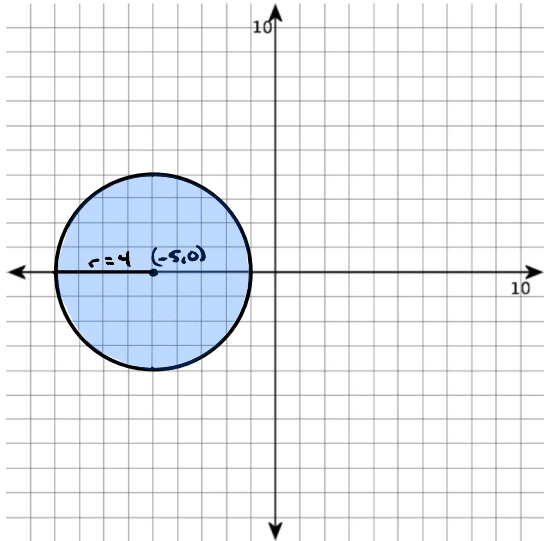
#11) $x^2 + 10x + y^2 + 9 = 0$

$$(x^2 + 10x + 25) + y^2 = -9 + 25$$

$$(x + 5)^2 + y^2 = 16$$

$$C = (-5, 0)$$

$$r = 4$$



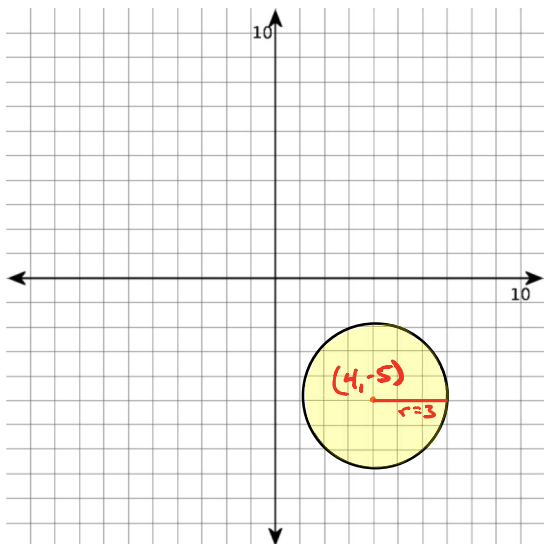
#12) $x^2 - 8x + y^2 + 10y = -32$

$$(x^2 - 8x + 16) + (y^2 + 10y + 25) = -32 + 16 + 25$$

$$(x - 4)^2 + (y + 5)^2 = 9$$

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

$$r = 3$$



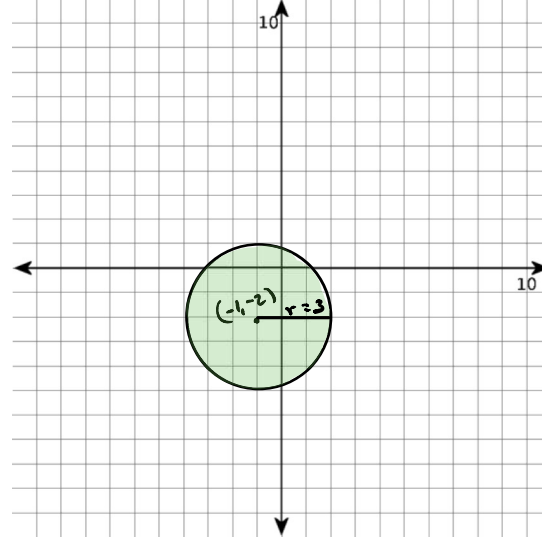
#13) $x^2 + 2x + y^2 + 4y = 4$

$$(x^2 + 2x + 1) + (y^2 + 4y + 4) = 4 + 1 + 4$$

$$(x + 1)^2 + (y + 2)^2 = 9$$

$$C = (-1, -2)$$

$$r = 3$$



#14) $x^2 - 12y + y^2 + 35 = 0$

$$x^2 + (y^2 - 12y + 36) = -35 + 36$$

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

$$C = (0, 6)$$

$$r = 1$$

