

Circles – Equation of a Circle

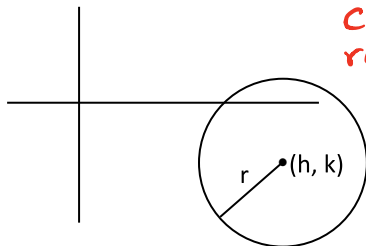
G.GPE.A.1

Notes Section 11.3

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

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



Center = (h, k)
radius = $\sqrt{r^2}$

Determine the coordinates of the center and the measure of the radius for each circle whose equation is given.

#1) $(x - 7)^2 + (y - 4)^2 = 6^2$

$r^2 = 6^2$
 $r = 6$

Center = $(7, 4)$

Radius = 6

#2) $(x + 5)^2 + (y + 11)^2 = 8^2$

$(x - (-5))^2 + (y - (-11))^2 = 8^2$

Center = $(-5, -11)$

Radius = 8

#3) $(x - 12)^2 + (y + 17)^2 = 100$

$(x - 12)^2 + (y - (-17))^2 = 10^2$

Center = $(12, -17)$

Radius = 10

#4) $(x + 21)^2 + (y - 41)^2 = 49$

$(x - (-21))^2 + (y - 41)^2 = 7^2$

Center = $(-21, 41)$

Radius = 7

#5) $(x - 2)^2 + (y - 1)^2 = \sqrt{81}$

$r = \sqrt{\sqrt{81}}$
 $r = \sqrt{9}$
 $r = 3$

Center = $(2, 1)$

Radius = 3

#6) $(x + 1)^2 + (y + \sqrt{2})^2 = 98$

$r^2 = 98$
 $r = \sqrt{98}$
 $r = \sqrt{49 \cdot 2}$
 $r = 7\sqrt{2}$

Center = $(-1, -\sqrt{2})$

Radius = $7\sqrt{2}$

The coordinates of the center and the measure of the radius of a circle are given. Write an equation of the circle.

#7) $(4, 9), 8$

$(x - 4)^2 + (y - 9)^2 = 8^2$

$(x - 4)^2 + (y - 9)^2 = 64$

#8) $(-5, -8), 11$

$(x - (-5))^2 + (y - (-8))^2 = 11^2$

$(x + 5)^2 + (y + 8)^2 = 121$

#9) $(-3, 6), \sqrt{2}$

$[x - (-3)]^2 + [y - 6]^2 = (\sqrt{2})^2$

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

#10) $(14, -19), \sqrt{10}$

$(x - 14)^2 + (y - (-19))^2 = (\sqrt{10})^2$

$(x - 14)^2 + (y + 19)^2 = 10$

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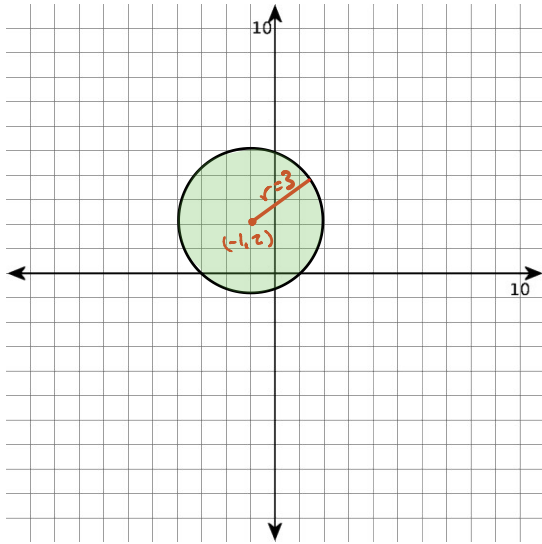
Graph each equation.

#11) $(x + 1)^2 + (y - 2)^2 = 9$

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

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

$$r = 3$$



#12) $x^2 + (y + 6)^2 - 25 = 0$

$$(x - 0)^2 + (y - (-6))^2 = 5^2$$

$$C = (0, -6)$$

$$r = 5$$

