

Writing Equations of Circles

ex: center $(7, -10)$ $r = 6$

$$(x-7)^2 + (y+10)^2 = 36$$

ex: center $(0, 5)$ $r = \sqrt{13}$

$$(x-0)^2 + (y-5)^2 = (\sqrt{13})^2$$
$$x^2 + (y-5)^2 = 13$$

ex: center $(-6, 0)$ $r = 2\sqrt{3}$

$$(x-(-6))^2 + (y-0)^2 = (2\sqrt{3})^2$$
$$(x+6)^2 + y^2 = 12$$

ex: center $(-4, 14)$ Pt. on the circle $(-3, 12)$

$$r = \sqrt{(-3-(-4))^2 + (12-14)^2}$$

$$r = \sqrt{5}$$

$$(x-(-4))^2 + (y-14)^2 = (\sqrt{5})^2$$

$$(x+4)^2 + (y-14)^2 = 5$$

ex: center $(0, 0)$ Point on circle $(-5, 11)$

$$r = \sqrt{(-5-0)^2 + (11-0)^2}$$

$$r = \sqrt{146}$$

$$(x-0)^2 + (y-0)^2 = (\sqrt{146})^2$$

$$x^2 + y^2 = 146$$

ex: endpoints of the diameter $(-5, -18)$ and $(-11, -8)$

$$\text{center: } \left(\frac{-5 + -11}{2}, \frac{-18 + -8}{2} \right) = (-8, -13)$$

$$\text{diameter: } \sqrt{(-11 - -5)^2 + (-8 - -18)^2}$$

$$d = 2\sqrt{34}$$

$$\div 2$$

$$r = \sqrt{34}$$

$$(x - -8)^2 + (y - -13)^2 = (\sqrt{34})^2$$

$$(x + 8)^2 + (y + 13)^2 = 34$$