

The Equation of a Circle in Standard Position

March 2/2016

Circle: The set of all points that are equidistant from a reference point (the centre).

Standard Position: The centre of the circle is at the origin $(0, 0)$.

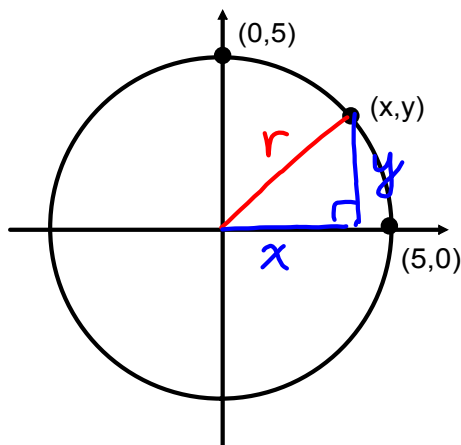
We can use this definition, along with the distance formula, to determine the equation of a circle.

Assigned Work:

p.91-92 # 1, 2, 3a, 4, 5, 6, 8

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Suppose we have a circle with a radius of 5, so every point on the circle is 5 units from the origin.



$$x^2 + y^2 = r^2$$

$$x^2 + y^2 = 5^2$$

$$x^2 + y^2 = 25$$

$$P(\sqrt{20}, \sqrt{5})$$

$$20 + 5$$

$$(\sqrt{20})^2 + (\sqrt{5})^2$$

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In general, a circle has a radius, r , and the equation of a circle in standard position is:

$$x^2 + y^2 = r^2$$

Ex. 1. Write the equation of a circle in standard position with:

(a) $r = 2$

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

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

(b) $r = 3\frac{1}{5}$

$$= 3 + \frac{1}{5}$$

$$= \frac{15}{5} + \frac{1}{5}$$

$$= \frac{16}{5}$$

$$x^2 + y^2 = \left(\frac{16}{5}\right)^2$$

$$x^2 + y^2 = \frac{256}{25}$$

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Ex.2 What is the radius of each circle?

(a) $x^2 + y^2 = 49$

(b) $x^2 + y^2 = 37$

$$r^2 = 49$$

$$r^2 = 37$$

$$r = \pm\sqrt{49}$$

$$r = \sqrt{37}, r > 0$$

$$r = 7$$

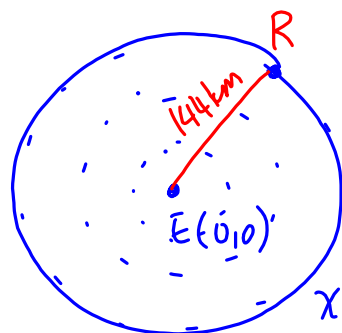
(r is a distance,
must be positive)

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Assigned Work:

p.91-92 # 1, 2, 3a, 4, 5, 6, 8

8(a)



$$r = 144$$

$$x^2 + y^2 = r^2$$

$$x^2 + y^2 = 144^2$$

$$x^2 + y^2 = 20736$$

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