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The Equation of a Circle in Standard Position

March 2 / 2010

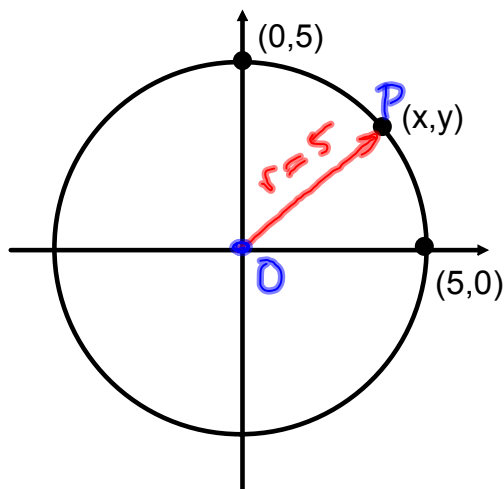
Circle: The set of all points that are equidistant from a reference point (the centre).

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.

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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.



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

$$5 = \sqrt{x^2 + y^2}$$

square both sides

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

or

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

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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) $r = 2$

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

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

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

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

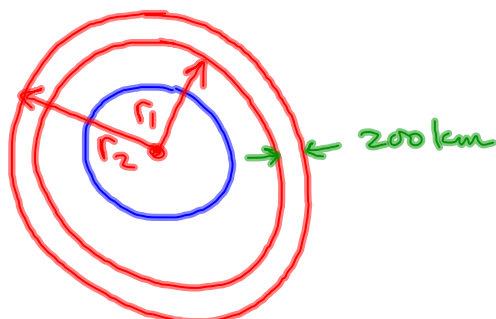
$$x^2 + y^2 = \frac{256}{25}$$

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Assigned Work:

p.155 # 1, 4bcd, 5ab, 8, 9, 10, 11

#8.



Circumference $C = 2\pi r$

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