

## Lesson Plan

Grade 10 Academic Math

Lesson: 3 - 4

Unit: Analytic Geometry

Topic: Equation of a Circle

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✚ **homework check:** Principles of Mathematics 10 p. 86 # 5ii), 6, 9, 12, 13

✚ **note:** Equations of Circles

It is important to note that the equation for a circle can also be related to the distance formula. By substituting the origin as our second point, we find the length of the radius of a circle is  $r = \sqrt{x^2 + y^2}$  which gives us  $r^2 = x^2 + y^2$  as the equation of the circle centred at the origin.  
examples)

- a) Write the equation of the circle centred at the origin with the point  $P(-5, 6)$  on the circumference.

**STEP 1: Find the length of the radius of the circle.**

$$d = \sqrt{(0 - (-5))^2 + (0 - 6)^2}$$

$$d = \sqrt{25 + 36}$$

$$d = \sqrt{61}$$

**Note:** *Do not use decimal approximations in your equations!*

**STEP 2: Write the equation**

$$\sqrt{61} = x^2 + y^2$$

- b) Find the x and y intercepts of the circle with equation  $x^2 + y^2 = 169$

\*Note: x intercepts occur when the value of y is zero and y intercepts occur when the value of x is zero

x intercepts

$$x^2 + (0)^2 = 169$$

$$x^2 = 169$$

$$x = \pm\sqrt{169}$$

$$x = \pm 13$$

$$(-13, 0) \text{ and } (13, 0)$$

y intercepts

$$(0)^2 + y^2 = 169$$

$$y^2 = 169$$

$$y = \pm\sqrt{169}$$

$$y = \pm 13$$

$$(0, -13) \text{ and } (0, 13)$$

✚ **homework assignment:** Principles of Mathematics 10 p. 91 # 2 – 6, 8, 10, 13, 14, 18