

**(A) Lesson Context**

BIG PICTURE of this UNIT:	<ul style="list-style-type: none"> <li>• mastery with algebraic skills to be used in our work with co-ordinate geometry (midpoint, length, slope)</li> <li>• understanding various geometric properties of quadrilaterals &amp; triangles</li> <li>• how do you really prove that something is “true”?</li> </ul>		
CONTEXT of this LESSON:	Where we’ve been  You know how to find a midpoint, a length and how to work with Geogebra	Where we are  Using length and midpoint in developing and working with equations of circles	Where we are heading  How can I prove various geometric properties of quadrilaterals and triangles?

**(B) Lesson Objectives:**

- a. Exploring the relationship between the midpoint, endpoints & circles (through geogebra)
- b. Determine the equation of a circle centred at the origin
- c. Explore and determine the equation of a circle NOT centred at the origin (through geogebra)

**(C) Analysis of a Circle**

- a. Given the circle with the equation of  $x^2 + y^2 = 25$ . Using GEOGEBRA, determine:
  1. Use the INPUT bar to write the equation.
  2. Determine the radius →
  3. Determine the x- and y-intercepts of the circle. →
  4. If  $x = 3$ , determine the value(s) for  $y$ . →
  5. If  $y = -1.5$ , determine the value(s) for  $x$ . →

- b. Given the circle with the equation of  $x^2 + y^2 = 100$ . Using ALGEBRA & your brains, determine:
1. Determine the radius →
  2. Determine the x- and y-intercepts of the circle. →
  3. If  $x = 6$ , determine the value(s) for  $y$ . →
  4. If  $y = -3$ , determine the value(s) for  $x$ . →
- c. Given a circle with its center at  $(0,0)$  and a point at  $(-5,12)$ , determine its equation USING ALGEBRA & your brains.
- d. Given a circle with the end points of its diameter being  $(-8,15)$  and  $(8,-15)$ , determine its equation USING ALGEBRA & your brains.

**(D) Analysis of Circles → Moving the Center**

- a. Given the circle with the equation of  $x^2 + y^2 = 25$ . Using GEOGEBRA, go to <http://www.geogebra.org/m/52682> and determine:
1. Move the sliders for “h” and “k” around to various positions
  2. Record the values of “h” and “k” as well as the new equation of the circle.

“h”	“k”	Equation

3. Explain the relationship between the values of “h” and “k” and the equation of a circle.

**(E) Homework/Resources**

[Nelson 10 Chap 2.3 – Equation of a Circle](#), p91-93, Q1,3,4,7

For advanced work & challenge, try <http://www.kutasoftware.com/FreeWorksheets/GeoWorksheets/11-Equations%20of%20Circles.pdf>