

**(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:**

- Apply the equation of a circle centred at the origin to geometric & contextual problems
- Explore and determine the equation of a circle NOT centred at the origin (through geogebra)

**(C) Skill REVIEW: Equations of Circles**

The equation of a circle centered at the origin having a radius of  $r$  is  $x^2 + y^2 = r^2$

<p>a. Given the circle with the equation of <math>x^2 + y^2 = 36</math>. Using GEOGEBRA, determine:</p> <ol style="list-style-type: none"> <li>Use the INPUT bar to write the equation.</li> <li>Determine the radius →</li> <li>Determine the domain and range of this relation.</li> <li>Determine the x- and y-intercepts of the circle. →</li> <li>If <math>x = -3</math>, determine the value(s) for <math>y</math>. →</li> <li>If <math>y = 2</math>, determine the value(s) for <math>x</math>. →</li> </ol>	<p>b. Given the circle with the equation of <math>x^2 + y^2 = 64</math>. Using ALGEBRA, determine:</p> <ol style="list-style-type: none"> <li>Determine the radius →</li> <li>Determine the domain and range of this relation.</li> <li>Determine the x- and y-intercepts of the circle. →</li> <li>If <math>x = 5</math>, determine the value(s) for <math>y</math>. →</li> <li>If <math>y = -3</math>, determine the value(s) for <math>x</math>. →</li> </ol>
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**(D) Applications with Circles – In Class Assignment**

<b><u>SKILLS TASK</u></b>	Complete the SKILLS REVIEW task (10 points each)	20 points
<b><u>“C” LEVEL</u></b>	Circle Geometry & Simple Applications of Circles  <a href="#">Complete Q8,11,12,14 &amp; 10, 15</a> (9 points each)  <a href="#">Check your ANSWERS here</a>	54 points
<b><u>“B” LEVEL</u></b>	Applications of Circles  <a href="#">Complete Q9,13,18</a> (5 points each) → <a href="#">ANS here</a>	15 points
<b><u>“A” LEVEL</u></b>	Problem Solving with Circles  <a href="#">Complete Q16, 19</a> & Section E (below) (3 points each)	12 points

**(E) 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.geogebraTube.org/student/m52682> 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.

**(F) Homework/Resources**

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