

Section 2.2 Guided Notebook**Section 2.2 Circles**

- Work through Section 2.2 TTK #1
- Work through Section 2.2 TTK #3
- Work through Section 2.2 TTK #4
- Work through Objective 1
- Work through Objective 2
- Work through Objective 3

Section 2.2 Circles**2.2 Things To Know**

1. Solving Quadratic Equations by Completing the Square (Section 1.4)

Review this objective as necessary. You **MUST** understand the concept of completing the square before you can be successful working with circles. What number must you add to complete the square: $x^2 - 10x$?

You should get an answer of 25. Why?

3. Finding the Midpoint of a Line Segment (Section 2.1)

Do you remember the Midpoint Formula? Write the midpoint formula here:

Midpoint Formula:

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What is the midpoint of the line segment joining points A and B ? $A(4, -1)$; $B(5, 6)$

You should get a midpoint of $\left(\frac{9}{2}, \frac{5}{2}\right)$.

4. Finding the Distance between Two Points Using the Distance Formula (Section 2.1)
Do you remember the Distance Formula? Write the distance formula here:

Distance Formula:

What is the distance $d(A, B)$ between the points A and B ? $A(10, 3)$; $B(-2, 19)$.

You should get a distance of 20.

An Introduction to Circles

Read the introduction to Section 2.2.

What is the definition of a circle?

Show how to derive the equation of a circle by watching the **animation** found in the introduction and take notes here:

Write the **standard form of an equation of a circle** here:

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Section 2.2 Objective 1 Writing the Standard Form of an Equation of a Circle

Work through the video that accompanies Example 1 and take notes here:

Find the standard form of the equation of the circle whose center is $(-2, 3)$ and with radius 6.

Work through Example 2 and take notes here:

Find the standard form of a circle whose center is $(0, 6)$ and that passes through the point $(4, 2)$.

Work through the video that accompanies Example 3 and take notes here:

Find the standard form of the equation of the circle that contains endpoints of a diameter at $(-4, -3)$ and $(2, -1)$.

Section 2.2 Objective 2 Sketching the Graph of a Circle

Work through the **Guided Visualization** titled “Sketching the Graph of a Circle” seen on page 2.2-7. Experiment by changing the values of the coordinates of the center and the radius. Then sketch two circles below. One circle should have a center located in Quadrant I and the other circle should have a center located in Quadrant IV.

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Work through the video that accompanies Example 4 and take notes here:

Find the center and radius, and sketch the graph of the circle $(x-1)^2 + (y+2)^2 = 9$. Also find any intercepts. **(Be sure to pay close attention to how we find intercepts.)**

Note: When determining intercepts algebraically, what does it mean if you get an imaginary solution?

Section 2.2 Objective 3 Converting the General Form of a Circle into Standard Form

What is the difference between standard form and general form?

Work through the video that accompanies Example 5 and take notes here:

Write the equation $x^2 + y^2 - 8x + 6y + 16 = 0$ in standard form; find the center, radius, and intercepts, and sketch the graph.

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Carefully work through the animation that accompanies Example 6 and take notes here:

Write the equation $4x^2 + 4y^2 + 4x - 8y + 1 = 0$ in standard form; find the center, radius, and intercepts, and sketch the graph.