

Topic 9.2 Circles

Essential Question:

What are the geometric properties of a circle, and how do they relate to algebraic representations of a circle?

Critique & Explain

Complete online.

CONCEPT Summary

Circles

DEFINITION

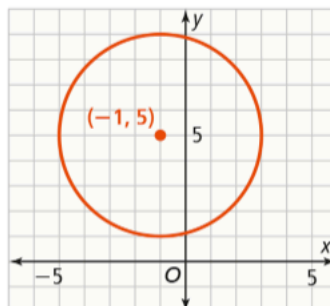
A circle is a set of points that are a fixed distance, called the *radius*, from a fixed point, called the *center*.

The **standard form of an equation of a circle** with center (h, k) and radius r is:

$$(x - h)^2 + (y - k)^2 = r^2.$$

GRAPH

Graph of $(x + 1)^2 + (y - 5)^2 = 4^2$



EQUATION

Complete the square to express the equation of a circle in standard form.

$$x^2 + y^2 + 2x - 10y + 10 = 0$$

$$(x^2 + 2x + 1) + (y^2 - 10y + 25) = -10 + 1 + 25$$

$$(x + 1)^2 + (y - 5)^2 = 4^2$$

Center: $(-1, 5)$, radius: 4

Q: What are the key features of a circle?

Q: How can you identify the radius and center of a circle in the standard form of an equation of a circle, $(x - h)^2 + (y - k)^2 = r^2$?

Notes:

Examples & Questions

Examples 1

Q: Why can the Pythagorean Theorem be applied when finding the equation of a circle?

Q: How does the formula work for all points on the circle?

Examples 2

Part A:

Q: Why is 0 subtracted from both x and y in the equation?

Q: Why is r^2 not a perfect square?

Q: Can you graph the exact circle?

Part B:

Q: How do you know that the graph of a circle is not a function?

Q: How do you determine the range for the graph?

Q: How do you determine the domain for the graph?

Examples 3

Part A:

Q: How do you find the midpoint of the diameter? Explain how the midpoint of the diameter is related to (h, k) .

Part B:

Q: How do you know whether the location of the kiosk does not interfere with the fence?

Q: After substituting the x - and y -values into the equation, what does it mean if the result is greater than 25?

Examples 4

Examples 5

Practice and Problem Solving

Complete MathXL for School: Practice and Problem Solving (online)

Complete MathXL for School: Enrichment (online)

Challenge: #16, 17, 39 – key will be posted in Power School Learning.

Lesson Quiz 9.2/Notes