**Unit 7 #1 Equations of Circles**



**Key Information**

The center of the circle: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The radius of the circle: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Any point on the circle: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| *r* is the radius of the circle so if we take the square root of the right hand side, we'll know how big the radius is. |

The equation of the circle: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Writing Equations of Circles:**

|  |  |  |
| --- | --- | --- |
| **Center** | **Radius** | **Equation** |
| (4,7) | 5 |  |
| (-3, 8) | 6.2 |  |
| (2, -9) | $$\sqrt{11}$$ |  |
| (0, 6) | $$\sqrt{7}$$ |  |
| (-1.9, 8.7) | 3 |  |

**Error Analysis:** A student says that the center of a circle with equation: (x – 2)2 + (y + 3) 2 = 16 is (-2, 3). What is the student’s error? How should the equation be written in order for the student to be correct?

**FINDING AN EQUATION OF A CIRCLE**

1. Circle A
center: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
radius: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Circle B
center: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
radius: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Circle O
center: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
radius: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**GRAPHING CIRCLES**

Let's look at the equation: 1: (x – 3)2 + (y – 2)2 = 9

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center:\_\_\_\_\_\_\_\_\_\_\_\_

radius:\_\_\_\_\_\_\_\_\_\_\_\_

2: (x – 5)2 + y2 = 36 3. (x + 4)2 + (y – 1)2 = 25

center:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ center:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
radius: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ radius: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Application Problem:** Suppose you know the endpoints of a circle. How do you determine the equation of the circle, if you don’t know the radius or center? *Endpoints at: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

FIND THE CENTER: EQUATION: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

FIND THE RADIUS:

**Practice Problem:** Find the center, the radius, and write the equation for the circle whose diameter has endpoints at (2, 6) and (5, 12).
****Center: \_\_\_\_\_\_\_\_\_\_\_\_\_

Radius: \_\_\_\_\_\_\_\_\_\_\_\_\_

Equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_