Guided Notes (Teacher Guide)

# Explain

|  |  |  |
| --- | --- | --- |
| A picture containing bubble  Description automatically generated  (0 , – r)  (– r , 0)  (0 , 0)  (r , 0)  (0 , r) | Equation of a Circle | Have students use one color to fill in the r for the radius, in both the equation and on the picture. Have students use different colors for the x-coordinate of the center and the y-coordinate of the center. This gives students color-coded reference notes for the equation and the picture. Have them do the same for the equation of any circle below. |
| x 2 + y 2 = r 2 |
| **center:** (0 , 0) |
| **radius:** r | Remind students that, even when we put a circle on the coordinate plane, the distance from the center is the radius. Be sure to emphasize that relationship between the radius and the center of the circle. |
|  |  |
| A picture containing bubble chart  Description automatically generated  radius  diameter  (h , k) | Equation of Any Circle |
| (x – h) 2 + (y – k) 2 = r 2 | This is a great time to show students what the equation of this circle would look like. The center is at , so we know that  and . By counting, we see the radius is 7. If we plug this information into the equation, we get . |
| **center:** (h , k) |
| **radius:** r |

**1)** Write the equation of a circle that has  and  as the endpoints of its diameter.

|  |  |
| --- | --- |
| **Teacher** | **Students** |
| What do we need to write the equation of a circle? | We need to know the center and the radius. |
| Where is the center of a circle? | The center is in between (perfectly in the middle of) the diameter’s two endpoints. |
| How do we find the point exactly in the middle of two points? | Midpoint formula (average): |
| Let’s calculate the midpoint (center). |  |
| How do we find the radius of a circle? | Two options: (1) find the diameter and divide it by two, or (2) find the distance between the center and a point on the circle. |
| How do we calculate the distance between two points? | Distance formula: |
| Let’s find the distance between the center  and  the endpoint . |  |
| Now that we know the center and the radius, we can write the equation of our circle. | center = , radius =  equation of a circle: |

**2)** What is the center and what is the radius of ?

 

Guided Notes (Model Notes)

# Explain

(– r , 0)

|  |  |
| --- | --- |
| A picture containing bubble  Description automatically generated  (r , 0)  (0 , r)  (0 , – r)  (0 , 0) | Equation of a Circle |
| x 2 + y 2 = r 2 |
| **center:** (0 , 0) |
| **radius:** r |
|  |  |
| A picture containing bubble chart  Description automatically generated  diameter  (h , k)  radius | Equation of Any Circle |
| (x – h) 2 + (y – k) 2 = r 2 |
| **center:** (h , k) |
| **radius:** r |

**1)** Write the equation of a circle that has  and  as the endpoints of its diameter.

|  |  |
| --- | --- |
| *midpoint* = |  |
|  |  |
| *center = find the midpoint of diameter* | *radius = distance between center & endpoint* |
|  |  |
| *center* = |  |
|  |  |
| *center* = | *radius* = |
|  |  |
| equation of a circle: | |

**2)** What is the center and what is the radius of ?

 