Example: Equation of a Circle Given the Center and One Point

Problem:

Find the equation of the circle with center at point negative 2, 2 and passes through the point 2, negative 1.

Solution:

We already know the center, so the next step is to find the radius. Remember that the radius is the distance between the center of the circle and any point on the circle.

We need to find the distance between the center, which is negative 2, 2 and the point 2, negative 1.

This distance is the radius of the circle.

To find the distance between two points, we use the distance formula, d equals the square root of the quantity x 1 minus x 2 squared plus the quantity y 1 minus y 2 squared.

R equals the square root of the quantity negative 2 minus 2 squared plus the quantity 2 minus negative 1 squared.

R equals the square root of the quantity negative 4 squared plus 3 squared.

R equals the square root of the quantity 16 plus 9.

R equals the square root of 25.

R equals 5.

Now that we know the center and the radius, we can use the general equation for a circle, which is the quantity x minus h squared plus the quantity y minus k squared equals r squared.

Using the information you have about this circle, substitute in the values. The quantity x minus negative 2 squared plus the quantity y minus 2 squared equals 5 squared.

Simplify this for the equation of the circle. The quantity x plus 2 squared plus the quantity y minus 2 square equals 25.

This is the equation of the circle with center at point negative 2, 2 and passes through the point 2, negative 1.