

Circle equation

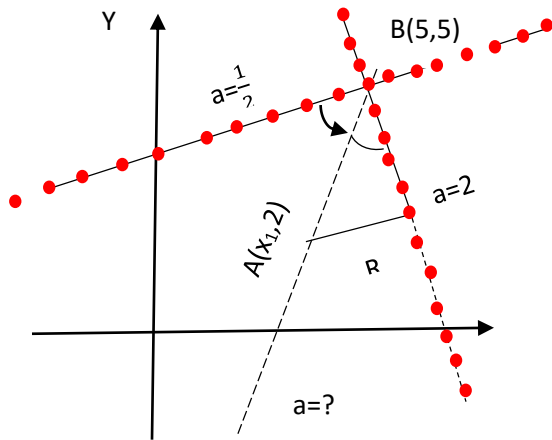
The center is A ($x_1, 2$)

Find the equation of the circle

The tangent to the circle

B(5, 5)

$$a = \frac{1}{2} \quad a = -2$$



$$\alpha = \beta$$

a is the slope of a line

Through the center of circle

$$\frac{a - \frac{1}{2}}{1 + \frac{a}{2}} = \frac{-2 - a}{1 + (-2a)} \Rightarrow a = 3$$

$$B(5, 5) \quad a = 3 \Rightarrow y - 5 = 3(x - 5)$$

$$y = 3x - 10$$

$$\text{the center} \Rightarrow 2 = 3 \cdot x_1 - 10$$

$$x_1 = \frac{12}{3} = 4 \quad A(4, 2)$$

R = ?

$2x + y - 15 = 0$ is the tangent

$$\frac{2x + y - 15}{\sqrt{5}} = 0 \quad (4, 2) \Rightarrow \left| \frac{8 + 2 - 15}{\sqrt{5}} \right| = \frac{5}{\sqrt{5}} = \sqrt{5}$$

$$(X - 4)^2 + (Y - 2)^2 = 5 \quad \text{the equation of the circle}$$