

Maths

# Find the Equation of a Tangent to a Circle at a Given Point

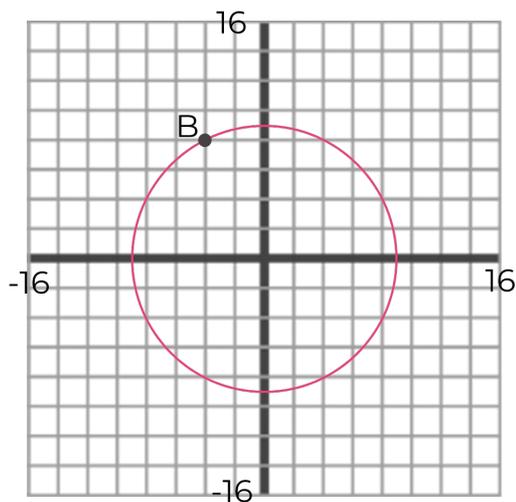
Miss Davies

**Please note some slides do have colour font on them**

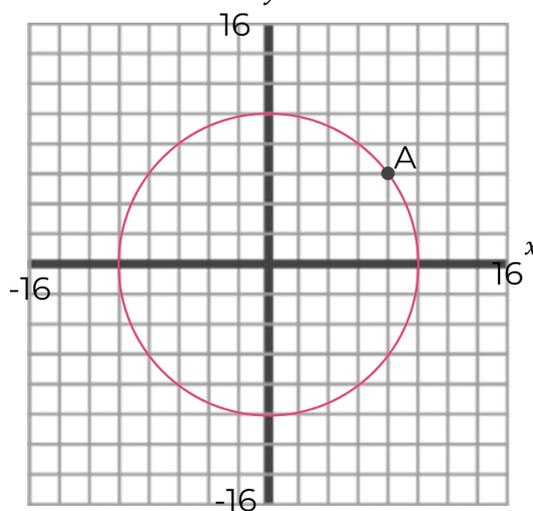


# Equation of a tangent

1. Find the equation of the tangent to the circle at point B.



2. Find the equation of the tangent to the circle at point A. Write the equation in the form  $ax + by + c = 0$



## Equation of a tangent

3. The circle  $x^2 + y^2 = 50$  has tangents at  $(7, -1)$  and  $(5, 5)$ . Find the point of intersection of the two tangents.

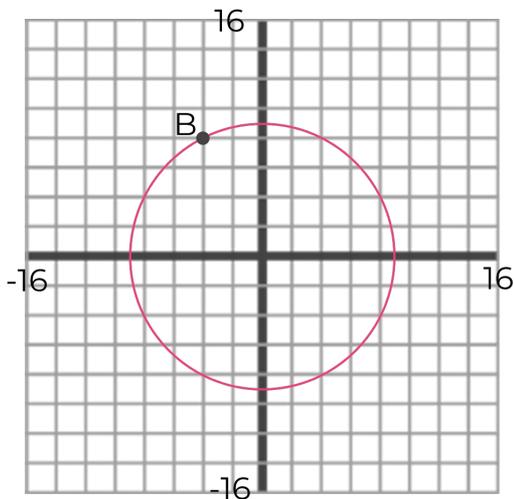


# Answers



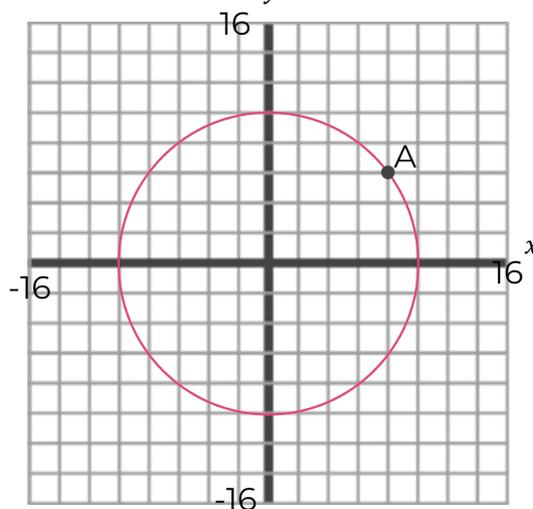
# Equation of a tangent

1. Find the equation of the tangent to the circle at point B.



Point B is  
 $(-4, 8)$   
Gradient of  
radius is  $-2$   
Gradient of  
tangent is  $\frac{1}{2}$   
Sub A into  
 $y = \frac{1}{2}x + c$   
 $c = 10$   
 $y = \frac{1}{2}x + 10$

2. Find the equation of the tangent to the circle at point A. Write the equation in the form  $ax + by + c = 0$



Point A is  $(8, 6)$   
Gradient of radius is  $\frac{3}{4}$   
Gradient of tangent  
is  $-\frac{4}{3}$   
Sub A into  
 $y = -\frac{4}{3}x + c$   
 $c = \frac{50}{3}$   
 $y = -\frac{4}{3}x + \frac{50}{3}$   
 $4x + 3y - 50 = 0$



## Equation of a tangent

3. The circle  $x^2 + y^2 = 50$  has tangents at  $(7, -1)$  and  $(5, 5)$ . Find the point of intersection of the two tangents.

Equation of the tangent at  $(7, -1)$ :  $y = 7x - 50$

Equation of the tangent at  $(5, 5)$ :  $y = -x + 10$

Point of intersection is  $(7.5, 2.5)$

