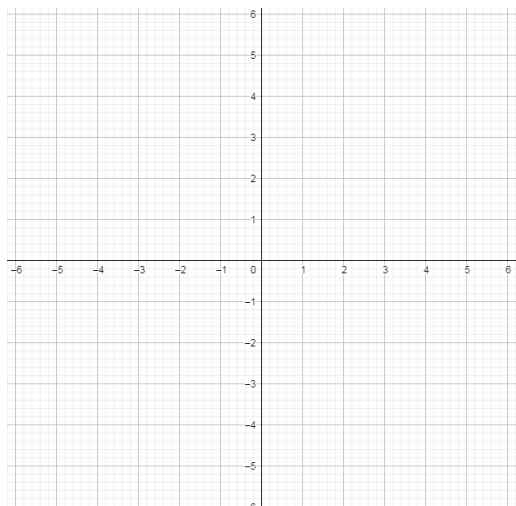


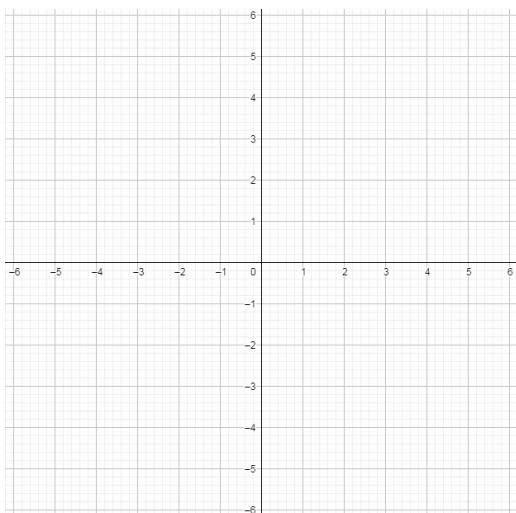
Equation of a Circle 2 (Tangents) – www.m4ths.com

(1) (a) Sketch the graph of $x^2 + y^2 = 16$ showing any points of intersection with the coordinate axes using a pair of compasses.



- (b) Draw a tangent to the circle at the point (0,4)
- (c) Draw a radius from (0,0) to (0,4)
- (d) What do you notice about the two lines? (Think about the gradient or direct of each line)

2(a) Sketch the graph of $x^2 + y^2 = 25$ showing any points of intersection with the coordinate axes using a pair of compasses.



- (b) Draw a tangent to the circle at the point (3,4)
- (c) Draw a radius from (0,0) to (3,4)
- (d) Write down the gradient of the radius and the gradient of the tangent at the point (3,4).

(3) (a) A circle has equation $x^2 + y^2 = 17$

- (b) Show that the point (1,4) lies on the circle
- (c) Find the gradient of the radius at the point (1,4)
- (d) Explain why the gradient of the tangent at the point (1,4) is $-1/4$

(e) Show that the equation of the tangent at the point (1,4) is $y = -\frac{1}{4}x + \frac{17}{4}$

(4) (a) Find the equation of the tangent to the circle $x^2 + y^2 = 10$ at the point (1,3)

(b) Find the equation of the tangent to the circle $x^2 + y^2 = 29$ at the point (5,2)

(c) Find the equation of the tangent to the circle $x^2 + y^2 = 5$ at the point (2,1)

(d) Find the equation of the tangent to the circle $x^2 + y^2 = 100$ at the point (-6,8)

(e) Find the equation of the tangent to the circle $x^2 + y^2 = 5$ at the point (1,-2)

(f) Find the equation of the tangent to the circle $x^2 + y^2 = 2$ at the point (-1,-1)