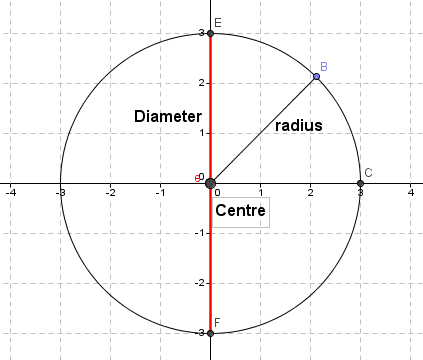
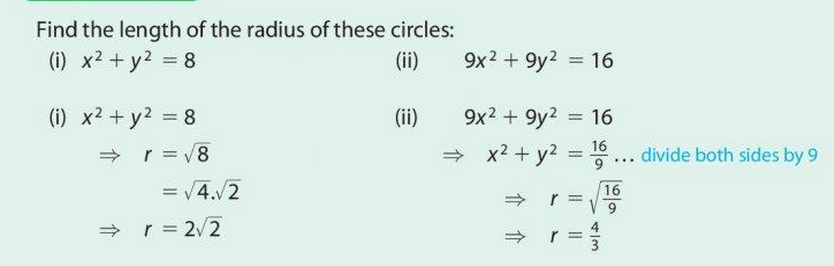
**The Circle**

1. There are 2 types of circle on the course:

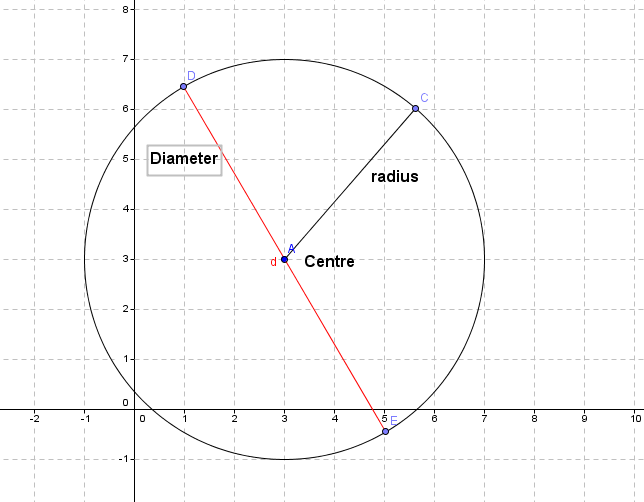


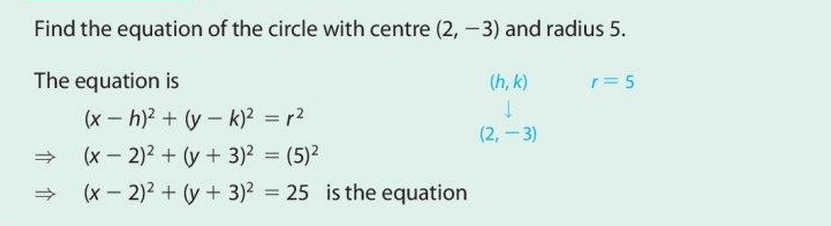
The centre of any circle in this form is always and the radius is always .



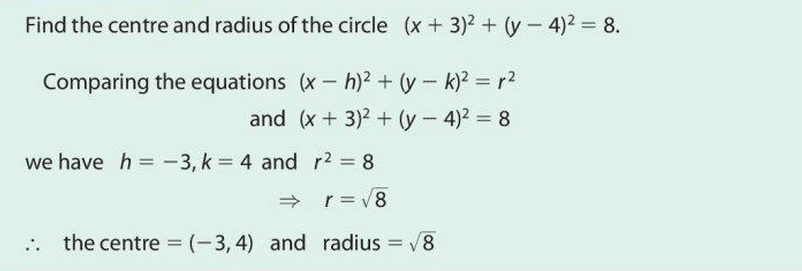
the centre of the circle is and

the centre of the circle is and

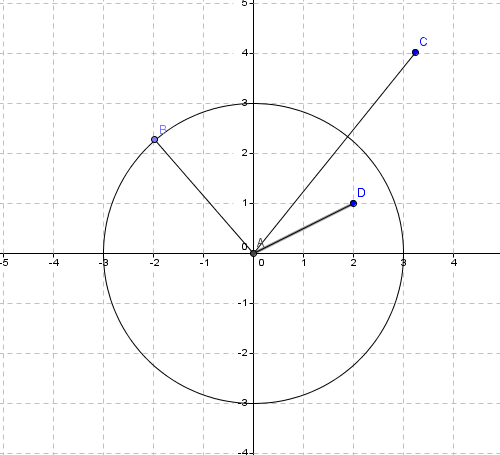




* the centre is (h,k) so you have to decide what value you put in for h and k that may change it from a negative to a positive or leave it as a positive.



**Checking if a point is ON,INSIDE or OUTSIDE a circle**



Above there is a circle with a centre (0, 0) and a radius = 3units

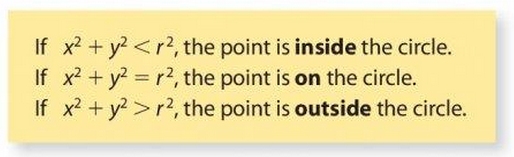
We can see that the point B is on the circle

We can see that the point C is outside the circle

We can see that the point D is inside the circle

* we could use the distance formula between the 2 points and if your answer is :
  + **Answer › radius** tells us the point is OUTSIDE
  + **Answer ‹ radius** tells us the point is INSIDE
  + **Answer = radius** tells us the point is ON

OR



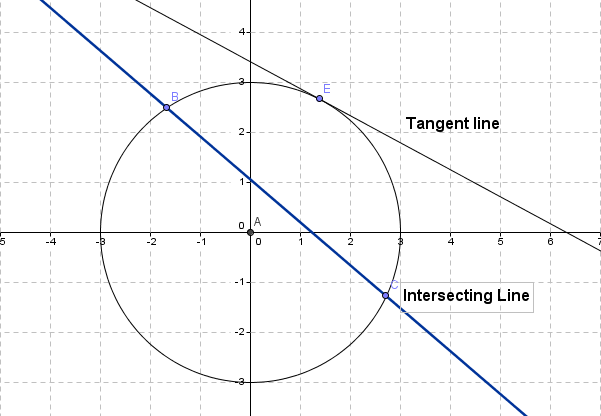
**Showing the point/s of intersection between line and circle**

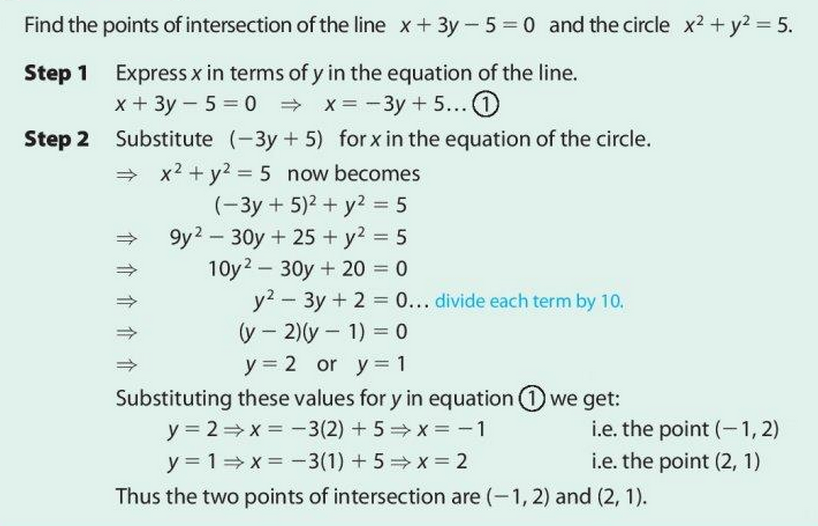
NB: you will be given the equation of a line and a circle

* Step 1: manipulate the LINE and rearrange it where you have either or
* Step 2: take your expression from Step 1 ( or )

And sub it in to the equation of the circle and SOLVE

* Step 3: when you have the solutions from Step 2 you sub them back in to Step 1 to find the corresponding values
* THESE ARE YOUR COORDINATES OF WHERE THE CIRCLE AND LINE INTERSECT
* If there are 2 points of contact then the line goes through the circle but if there is only 1 point (repeated) then the line is a tangent line.





**Step 3**

In the above example we can see in Step 1 that we have written the line in the form x = …

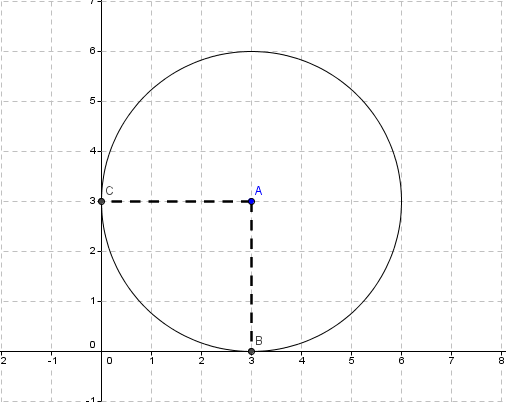
Step 2 sees the expression for x = … in Step 1 being substituted in to the Circle Equation. Where we have an x is replaced with (-3y + 5)

This equation is now solved - you may of course use the

We then take the values for and find corresponding

These pairs are the ‘points of contact’ or ‘intersection points’

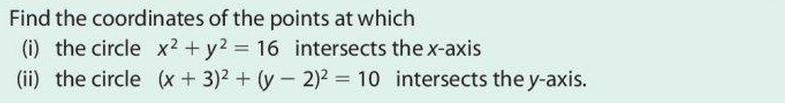
**Finding where circles cross the x and y axis**

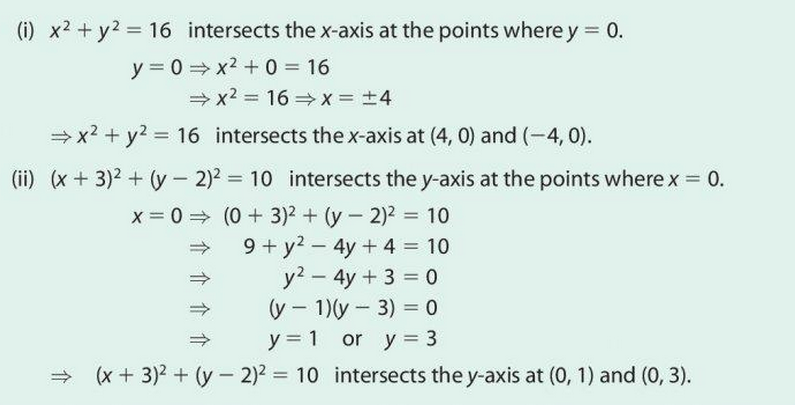


(3, 0)

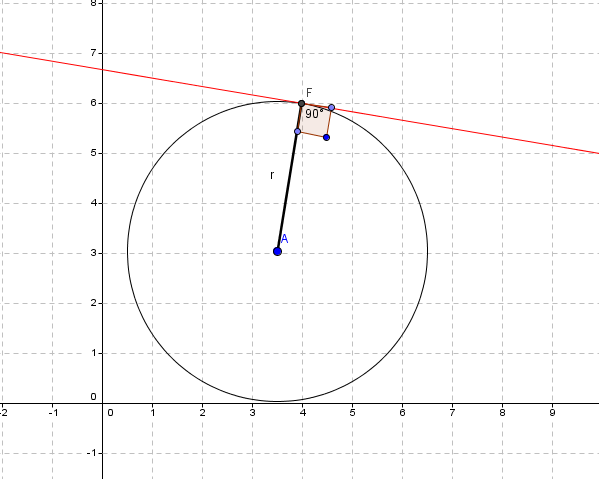
(0, 3)

* When trying to find where a circle crosses the x – axis put y = 0 in the circle and solve for x
* When trying to find where a circle crosses the y – axis put x = 0 in the circle and solve for y





**Equation of a Tangent to a Circle at a give point**



Tangent

* The red line is a tangent line and makes a RIGHT ANGLE with the radius of the circle.
* This means we have to use the Centre and Point of contact and the SLOPE FORMULA to calculate the slope of the radius line segment
* :as the radius is at a RIGHT ANGLE to the TANGENT
* When you have found the slope of the TANGENT LINE you can now use this SLOPE and the EQUATION of a LINE Formula to find the Equation of the Tangent Line

NB : you must have 1. Point & 2. Slope of the tangent before you can get it’s equation.