

## (31) The Equation of a Circle

### WORKING AT D/E

(1) Write down the equation of a circle with centre  $(0,0)$  and radius 6.

(2) Find the equation of a circle with centre  $(-3,6)$  and diameter 14.

(3) Find the centre and radius of the circle with equation  $x^2 + y^2 + 2x - 4y - 20 = 0$

### WORKING AT B/C

(1) A circle has equation  $(x - 4)^2 + (y + p)^2 = 97$

Given that the point  $(0,2)$  lies on the circle, find the two possible values of  $p$ .

(2) Show that the length of the radius of the circle with equation  $x^2 + y^2 + 3x - 5y - 2 = 0$  is  $\frac{\sqrt{42}}{2}$

(3) Explain why the circle with equation  $(x - 8)^2 + (y + 10)^2 = 60$  doesn't cross any of the coordinate axes.

### WORKING AT A\*/A

(1) A circle in the  $xy$  plane has centre  $(4,6)$  and radius  $2\sqrt{5}$ . Given that the point  $P$  with coordinates  $(7, p)$  lies inside the circle, find the set of possible values of  $p$ .

(2) A circle with equation  $x^2 + (y + 8)^2 = r^2$  crosses the  $x$  axis at two points.

(a) Find the set of values for which  $r$  is valid

(b) Write down the equations of the horizontal tangents to the circle when  $r^2 = 100$ .

(3) A circle has equation  $x^2 + y^2 - 6x + 2py + 12 = 0$  where  $p$  is a constant. Find the set of possible values of  $p$ .