CIRCLES PROBLEMS

STUDENT RESOURCE

Use squared paper or the **Circles** program or dynamic geometry software to draw diagrams to help you solve these problems.

1 Find the points of intersection of these two circles.

$$x^2 + 2x + y^2 + 4y = 5 \text{ and } x^2 - 8x + y^2 - 6y + 5 = 0$$

Now find the equation of the straight line through these points of intersection.

Also find the equation of any other circle through these points of intersection.

2 Find the points of intersection of these two circles.

$$x^2 - 4x + y^2 - 6y = 13 \text{ and } x^2 - 12x + y^2 - 14y + 59 = 0$$

Now find the equation of the straight line through these points of intersection.

Also find the equation of any other circle through these points of intersection.

3 Show that these two circles touch.
What is the point at which they touch?

$$x^2 - 2x + y^2 - 6y + 1 = 0 \text{ and } x^2 - 16x + y^2 - 6y = 27$$

4 The line $2y - x = 5$ is a tangent to a family of circles at the point **(−1, 2)**.

Find the equation of one of them.

5 A chord of a circle has end-points at **(2, 6)** and **(−2, 8)**.

Find the equation of one of the diameters of the circle.

6 Prove that one of these circles lies entirely inside the other.

$$x^2 - 10x + y^2 - 10y + 14 = 0 \text{ and } x^2 - 4x + y^2 - 6y + 8 = 0$$

7 The equation of circle **C1** is $x^2 - 6x + y^2 - 4y + 5 = 0$.
The centre of circle **C2** is **(6, 5)**.
  What is the equation of circle **C2** if:
    (a) the circles touch externally?
    (b) the circles touch internally?

STUDENT RESOURCE

4—Coordinate geometry

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