CIRCLES PROBLEMS

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

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

9 Find the equation of the circle that passes through the points **(4, 1) (5, 2)** and **(4, 7)**.

10 Two circles have the same centre but different radii. One circle passes through the points **(−4, 2)** and **(−7, 5)**; the other circle passes through the points **(−2, 9)** and **(−10, 7)**. Find the equations of both circles.

11 A circle has its centre on the **y**-axis and passes through the points **(4, 3)** and **(−3, 10)**. Find its equation.

A second circle has its centre on the **x**-axis and passes through the same two points. Find its equation.

A third circle passes through the same two points and one of its tangents is **y = 10**. Find its equation.

12 Show that these three circles have a common point.

$$x^2 + 2x + y^2 - 4y = 5$$
$$x^2 - 14x + y^2 - 14y + 57 = 0$$
$$x^2 - 10x + y^2 + 2y + 1 = 0$$

13 Show that these two circles cut orthogonally (in other words, their tangents where they intersect are perpendicular)

$$x^2 + 6x + y^2 - 4y + 3 = 0 \text{ and } x^2 - 8x + y^2 - 6y = 15$$

14 Show that the points of intersection of these two circles are at opposite ends of a diameter of one of them.

$$x^2 - 10x + y^2 - 12y + 56 = 0 \text{ and } x^2 - 6x + y^2 - 4y = 12$$

15 The lines **x = 2** and **y = 9** are tangents to a circle which passes through the origin. Use squared paper or the **Circles** program to find the equation of the circle.

4—Coordinate geometry **STUDENT RESOURCE**

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