**Using Properties and Equations of Circles GREEN**

1. The points U(-2, 8), V(7, 7) and W(-3, -1) lie on a circle.

 a) Show that the triangle UVW has a right angle.

 b) Write down an equation for the circle.

2. The points R(-2, 1), S(4, 3) and T(10, -5) lie on the circumference of a circle. Find an equation of the circle.

3. Consider the points A(3, 15), B(-13, 3), C(-7, -5) and D(8, 0).

 a) Show that ABC is a right-angled triangle.

 b) Find the equation of the circumcircle.

 c) Hence show that A, B, C and D all lie on the circumference of this circle.

4. A circle has equation x² + 2x + y² - 24y – 24 = 0

 a) Find the centre and radius of the circle.

 The points A(-13, 17) and B(11, 7) both lie on the circumference of the circle.

b) Show that AB is a diameter of the circle.

The point C lies on the negative x-axis and the angle ACB = 90º.

c) Find the coordinates of C.

**Using Properties and Equations of Circles AMBER**

1. The points U(-2, 8), V(7, 7) and W(-3, -1) lie on a circle.

Start by calculating the gradients of all 3 lines. Are any perpendicular?

 a) Show that the triangle UVW has a right angle.

Calculate midpoint of diameter to find centre of circle.

 b) Write down an equation for the circle.

2. The points R(-2, 1), S(4, 3) and T(10, -5) lie on the circumference of a circle. Find an equation of the circle.

For equation of a circle, we need length of radius and centre point. We can use the intersection of perpendicular bisectors to find the centre. The length of the radius will be the distance from the centre to any vertex of the triangle.

3. Consider the points A(3, 15), B(-13, 3), C(-7, -5) and D(8, 0).

Start by calculating the gradients of all 3 lines. Are any perpendicular?

 a) Show that ABC is a right-angled triangle.

 b) Find the equation of the circumcircle.

Calculate midpoint of diameter to find centre of circle.

 c) Hence show that A, B, C and D all lie on the circumference of this circle.

Substitute D into the equation of the circle.

4. A circle has equation x² + 2x + y² - 24y – 24 = 0

Complete the square for x and y.

 a) Find the centre and radius of the circle.

 The points A(-13, 17) and B(11, 7) both lie on the circumference of the circle.

b) Show that AB is a diameter of the circle.

Calculate midpoint of diameter to find centre of circle.

The point C lies on the negative x-axis and the angle ACB = 90º.

Substitute C into the equation of the circle.

c) Find the coordinates of C.

**Using Properties and Equations of Circles RED**

1. The points U(-2, 8), V(7, 7) and W(-3, -1) lie on a circle.

Start by calculating the gradients of all 3 lines. Are any perpendicular?

 a) Show that the triangle UVW has a right angle.

 Gradient UV = \_\_\_\_\_\_\_ =

Gradient VW = \_\_\_\_\_\_\_ =

 Gradient UW = \_\_\_\_\_\_\_ =

Calculate midpoint of diameter to find centre of circle.

 b) Write down an equation for the circle.

 Midpoint \_\_\_\_ =

 (x )² + (y )² =

2. The points R(-2, 1), S(4, 3) and T(10, -5) lie on the circumference of a circle. Find an equation of the circle.

For equation of a circle, we need length of radius and centre point. We can use the intersection of perpendicular bisectors to find the centre. The length of the radius will be the distance from the centre to any vertex of the triangle.

 Gradient RS = \_\_\_\_\_\_\_ =

 Midpoint RS =

Gradient ST = \_\_\_\_\_\_\_ =

 Midpoint ST =

3. Consider the points A(3, 15), B(-13, 3), C(-7, -5) and D(8, 0).

Start by calculating the gradients of all 3 lines. Are any perpendicular?

 a) Show that ABC is a right-angled triangle.

 b) Find the equation of the circumcircle.

Calculate midpoint of diameter to find centre of circle.

 c) Hence show that A, B, C and D all lie on the circumference of this circle.

Substitute D into the equation of the circle.

4. A circle has equation x² + 2x + y² - 24y – 24 = 0

Complete the square for x and y.

 a) Find the centre and radius of the circle.

 The points A(-13, 17) and B(11, 7) both lie on the circumference of the circle.

b) Show that AB is a diameter of the circle.

Calculate midpoint of diameter to find centre of circle.

The point C lies on the negative x-axis and the angle ACB = 90º.

Substitute C into the equation of the circle.

c) Find the coordinates of C.