

Linear and Quadratic Simultaneous Equations

For AQA GCSE Mathematics (8300) • Higher tier

Name _____

Total marks: **28**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method.

- 1** Solve the simultaneous equations

$$y = x^2$$
$$x + y = 6$$

[4 marks]

Answer _____

- 2** A curve has the equation $y = x^2 - 3x + 5$
A straight line has the equation $y = 2x + 1$
Work out the two points of intersection of the curve and the straight line.

[4 marks]

Answer _____

- 3** Solve the simultaneous equations

$$x^2 + y^2 = 25$$

$$y = x + 1$$

[5 marks]

Answer _____

- 4** $(3, -1)$ is one solution of the simultaneous equations

$$x^2 + y^2 = k$$

$$y = mx + 5$$

Work out the value of k and the value of m .

[3 marks]

$k =$ _____ $m =$ _____

- 5 A curve has equation $y = x^2 + 4x + 1$
A line has equation $y = 2x - 5$
Use algebra to show that the curve and the line do not meet.

[4 marks]

6 The line $y = x + 4$ meets the circle $x^2 + y^2 = 58$ at the points P and Q .

- (a) Show that the x -coordinates of P and Q satisfy the equation
$$x^2 + 4x - 21 = 0$$

[3 marks]

- (b) Work out the length of PQ .
Give your answer in the form $a\sqrt{2}$ where a is an integer.
You must show your working.

[5 marks]

Answer _____