

OCR Additional Maths Exam Questions - Simultaneous Equations

- 8 Calculate the x -coordinates of the points of intersection of the line $y = 2x + 11$ and the curve $y = x^2 - x + 5$. Give your answers correct to 2 decimal places. [5]

- 12 The Highway Code gives a table of shortest stopping distances (d feet) for a vehicle travelling at v miles per hour.

The formula used for this table is given by

$$d = av^2 + bv.$$

Two entries in the table are given below.

v mph	d feet
30	75
60	240

- (i) By forming and solving a pair of simultaneous equations in a and b , show that the formula is

$$d = \frac{v^2}{20} + v. \quad [5]$$

- (ii) Find the difference between the stopping distances for a car travelling at 65 mph and a car travelling at 70 mph. [3]

- (iii) Many drivers maintain a distance of 50 feet or less when driving on a motorway.

Use the formula in part (i) to find the speed at which the shortest stopping distance is 50 feet. [4]

- 7 (i) Solve algebraically the simultaneous equations $y = 3 + 5x - x^2$ and $y = x + 7$. [4]

- (ii) Interpret your answer geometrically. [1]

- 10 Find the coordinates of the points of intersection of the line $y = 5 - 2x$ with the curve $y = x^2 - 4x - 11$, giving your answers correct to 2 decimal places. [7]

- 3 Find the points of intersection of the line $y = 5x + 13$ with the circle $x^2 + y^2 = 13$. [5]