1 Solve the simultaneous equations

$$7x + 2y = 5.5$$
$$3x - 5y = 17$$

Show clear algebraic working.

$x =$ .....

$y =$ .....

(Total for Question 1 is 4 marks)

2 Solve the simultaneous equations

$$7x - 2y = 34$$
$$3x + 5y = -3$$

Show clear algebraic working.

$x =$ .....

$y =$ .....

(Total for Question 2 is 4 marks)

3 Solve the simultaneous equations

$$3xy - y^2 = 8$$
$$x - 2y = 1$$

Show clear algebraic working.

.....

(Total for Question 3 is 5 marks)

4 Solve the simultaneous equations

$$3x + 5y = 6$$
$$7x - 5y = -11$$

Show clear algebraic working.

$x =$ .....

$y =$ .....

(Total for Question 4 is 3 marks)

5 Triangle HJK is isosceles with $HJ = HK$ and $JK = \sqrt{80}$

H is the point with coordinates $(-4, 1)$
J is the point with coordinates $(j, 15)$ where $j < 0$
K is the point with coordinates $(6, k)$

M is the midpoint of JK.
The gradient of HM is 2

Find the value of j and the value of k.

j = ...

k = ...

(Total for Question 5 is 6 marks)

6 The line with equation $y = x + 2$ intersects the curve with equation $x^2 + y^2 - 2y = 24$ at the points A and B.

Find the coordinates of A and B.
Show clear algebraic working.

(..... , ...)

(..... , ...)

(Total for Question 6 is 5 marks)

7 Given that $x = \dfrac{5}{9y + 5}$ and that $y = \dfrac{5}{5a - 2}$

find an expression for x in terms of a.
Give your expression as a single fraction in its simplest form.

.....

(Total for Question 7 is 4 marks)

8 Solve the simultaneous equations

$$5a + 2c = 10$$
$$2a - 4c = 7$$

Show clear algebraic working.

$a =$ .....

$c =$ .....

(Total for Question 8 is 3 marks)

9 Solve the simultaneous equations

$$y = 3 - 2x$$
$$x^2 + y^2 = 18$$

Show clear algebraic working.

.....

(Total for Question 9 is 5 marks)

10 Solve the simultaneous equations

$$x - 6y = 5$$
$$xy - 2y^2 = 6$$

Show clear algebraic working.

.....

(Total for Question 10 is 5 marks)

11 Solve the simultaneous equations $2x + 7y = 17$
$5x + 3y = -1$

Show clear algebraic working.

$x =$ .....

$y =$ .....

(Total for Question 11 is 4 marks)

12 Solve the simultaneous equations

$$x^2 - 9y - x = 2y^2 - 12$$
$$x + 2y - 1 = 0$$

Show clear algebraic working.

.....

(Total for Question 12 is 5 marks)

13 Solve the simultaneous equations

$$3x - 5y = 25$$
$$4x + 3y = 14$$

Show clear algebraic working.

$x =$ .....

$y =$ .....

(Total for Question 13 is 4 marks)

14 The sum of the first 10 terms of an arithmetic series is 4 times the sum of the first 5 terms of the same series.

The 8th term of this series is 45

Find the first term of this series.
Show clear algebraic working.

.....

(Total for Question 14 is 5 marks)

15 Solve the simultaneous equations

$$x - 2y = 3$$
$$x^2 - y^2 + 2x = 10$$

Show clear algebraic working.

.....

(Total for Question 15 is 5 marks)

16 Solve the simultaneous equations

$$7x + 3y = 3$$
$$3x - y = 7$$

Show clear algebraic working.

$x =$ .....

$y =$ .....

(Total for Question 16 is 3 marks)

17 The line with equation $2y = x + 1$ intersects the curve with equation $3y^2 + 7y + 16 = x^2 - x$ at the points A and B

Find the coordinates of A and the coordinates of B
Show clear algebraic working.

(..... , ...) and (..... , ...)

(Total for Question 17 is 5 marks)

18 Solve the simultaneous equations

$$3x^2 + y^2 - xy = 5$$
$$y = 2x - 3$$

Show clear algebraic working.

.....

(Total for Question 18 is 5 marks)

19 Solve the simultaneous equations

$$3x + 5y = 3.1$$
$$6x + 3y = 3.75$$

Show clear algebraic working.

$x =$ .....

$y =$ .....

(Total for Question 19 is 3 marks)

20 An arithmetic series has first term a and common difference d, where d is a prime number.

The sum of the first n terms of the series is S_n and

$S_m = 39$

$S_{2m} = 320$

Find the value of d and the value of m
Show clear algebraic working.

$d =$ .....

$m =$ .....

(Total for Question 20 is 5 marks)

21 Solve the simultaneous equations

$$x + 2y = 15$$
$$4x - 6y = 4$$

Show clear algebraic working.

$x =$ .....

$y =$ .....

(Total for Question 21 is 3 marks)

22 Solve the simultaneous equations

$$2y^2 + x^2 = -6x + 42$$
$$2x + y = -3$$

Show clear algebraic working.

.....

(Total for Question 22 is 5 marks)

23 Solve the simultaneous equations

$$5x + 4y = -2$$
$$2x - y = 4.4$$

Show clear algebraic working.

$x =$ .....

$y =$ .....

(Total for Question 23 is 3 marks)

24 Solve the simultaneous equations

$$y = 7 - 2x$$
$$x^2 + y^2 = 34$$

Show clear algebraic working.

.....

(Total for Question 24 is 5 marks)

25 Work out the coordinates of the points of intersection of

$$y - 2x = 1 \quad \text{and} \quad y^2 + xy = 7$$

Show clear algebraic working.

(..... , ...)

(..... , ...)

(Total for Question 25 is 5 marks)

26 The straight line with equation $y - 2x = 7$ is the perpendicular bisector of the line AB where A is the point with coordinates $(j, 7)$ and B is the point with coordinates $(6, k)$

Find the coordinates of the midpoint of the line AB
Show clear algebraic working.

(..... , ...)

(Total for Question 26 is 6 marks)

27 Solve the simultaneous equations

$$2x + 9y = 14.5$$
$$7x + 3y = 8$$

Show clear algebraic working.

$x =$ .....

$y =$ .....

(Total for Question 27 is 3 marks)

28 Solve the simultaneous equations

$$2x^2 + 3y^2 = 11$$
$$x = 3y - 1$$

Show clear algebraic working.

.....

(Total for Question 28 is 5 marks)