Simultaneous Equations (Quadratic) Worksheet

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Topic tags have been given for each question to enable you to know if you can do the question or whether you need to wait to cover the additional topic(s).

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Qualification: GCSE Edexcel Higher

Areas: Algebra

Subtopics: Solving Simultaneous Equations - Quadratic

Paper: Paper-1H-Non-Calculator / Series: 2017-June / Difficulty: Medium / Question Number: 20

20 Solve algebraically the simultaneous equations

$$x^2 + y^2 = 25$$
$$y - 3x = 13$$

.....

(Total for Question 20 is 5 marks)

18 Solve the simultaneous equations

$$2x^2 + 3y^2 = 14$$

$$x = 2y - 3$$

Show clear algebraic working.

.....

(Total for Question 18 is 5 marks)

Qualification: GCSE Edexcel Higher

Areas: Algebra

Subtopics: Solving Simultaneous Equations - Quadratic

Paper: Paper-3H-Calculator / Series: 2018-November / Difficulty: Medium / Question Number: 19

19 Solve algebraically the simultaneous equations

$$2x^2 - y^2 = 17$$
$$x + 2y = 1$$

.....

(Total for Question 19 is 5 marks)

22 Solve the simultaneous equations

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

$$y = 2x + 1$$

Show clear algebraic working.

.....

(Total for Question 22 is 5 marks)

20 Solve algebraically the simultaneous equations

$$x^2 - 4y^2 = 9$$
$$3x + 4y = 7$$

(Total for Question 20 is 5 marks)

16 Solve the simultaneous equations

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

Show clear algebraic working.

.....

(Total for Question 16 is 5 marks)

17 Solve the simultaneous equations

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

Show clear algebraic working.

.....

(Total for Question 17 is 5 marks)

19 Solve the simultaneous equations

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

Show clear algebraic working.

.....

(Total for Question 19 is 5 marks)

19 Solve the simultaneous equations

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

Show clear algebraic working.

(Total for Question 19 is 5 marks)

21 Solve the simultaneous equations

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

Show clear algebraic working.

.....

(Total for Question 21 is 5 marks)

20 Solve the simultaneous equations

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

Show clear algebraic working.

.....

(Total for Question 20 is 5 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)

21 Solve the simultaneous equations

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

Show clear algebraic working.

.....

(Total for Question 21 is 5 marks)

Qualification: IGCSE Edexcel A Higher

Areas: Algebra

Subtopics: Intersection Of Graphs, Intersection Points, Solving Simultaneous Equations - Quadratic

Paper: Paper-2HR / Series: 2023-June / Difficulty: Medium / Question Number: 21

21 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 21 is 5 marks)

22 Solve the simultaneous equations

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

Show clear algebraic working.

.....

(Total for Question 22 is 5 marks)

Qualification: GCSE Edexcel Higher

Areas: Algebra

Subtopics: Solving Simultaneous Equations - Quadratic

Paper: Paper-2H-Calculator / Series: Sample-Set-2 / Difficulty: Medium / Question Number: 20

20 Solve algebraically the simultaneous equations

$$x^2 + y^2 = 25$$
$$y - 2x = 5$$

.....

(Total for Question 20 is 5 marks)

Qualification: IGCSE Edexcel A Higher

Areas: Algebra

Subtopics: Solving Simultaneous Equations - Quadratic

Paper: Paper-1H / Series: 2021-January / Difficulty: Medium / Question Number: 19

19 Solve the simultaneous equations

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

Show clear algebraic working.

.....

(Total for Question 19 is 5 marks)

16 The curve **C** has equation $y = x^2 + 3x - 3$

The line **L** has equation $y - 5x + 4 = 0$

Show, algebraically, that **C** and **L** have exactly one point in common.

(Total for Question 16 is 4 marks)

22 **L** is the straight line with equation $y = 2x - 5$

C is a graph with equation $y^2 = 6x^2 - 25x - 8$

Using algebra, find the coordinates of the points of intersection of **L** and **C**.
You must show all your working.

(..... , ...)

(..... , ...)

(Total for Question 22 is 5 marks)

21 The line with equation $x + 2y = 5$ intersects the curve with equation $x^2 + 3y^2 = 13$ at the points A and B

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

(..... , ...)

(..... , ...)

(Total for Question 21 is 5 marks)

22 The straight line **L** has equation $x + y = 5$

The curve **C** has equation $2x^2 + 3y^2 = 210$

Find the coordinates of the points where **L** and **C** intersect.
Show clear algebraic working.

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

(Total for Question 22 is 5 marks)

21 The curve with equation $y = (10x - 3)(x + 1)$ and the line with equation $y - 6x = 0$ intersect at the points A and B.

Find the coordinates of the midpoint of AB.
Show your working clearly.

(..... , ...)

(Total for Question 21 is 6 marks)

22 The curve with equation $x^2 - x + y^2 = 10$ and the straight line with equation $x - y = -4$ intersect at the points A and B.

Work out the exact length of AB.

Show your working clearly and give your answer in the form $\frac{\sqrt{a}}{2}$ where a is an integer.

(Total for Question 22 is 6 marks)

13 **C** is the curve with equation $y = x^2 - 4x + 4$

L is the straight line with equation $y = 2x - 4$

L intersects **C** at two points, A and B.

Calculate the exact length of AB.

(Total for Question 13 is 6 marks)