THIRD SPACE LEARNING

GCSE Exam Questions

Quadratic Simultaneous Equations | Algebra

GCSE Exam Questions: Quadratic Simultaneous Equations

1) Solve the simultaneous equations: $xy = 12$

$y - 3x + 9 = 0$

(5 marks)

2) Solve the simultaneous equations: $a^2 + b^2 = 20$

$b + 10 = 2a$

(5 marks)

3) Solve the simultaneous equations: $x^2 - 4y^2 = 9$

$3x + 4y = 7$

(5 marks)

4) Find the distance between the two points of intersection of the two lines: $y = 2x^2 - 3x - 10$ and $2x - y + 2 = 0$

(6 marks)

GCSE Exam Questions: Quadratic Simultaneous Equations Answers

	Question	Answer	Marks
1)	Solve the simultaneous equations $xy = 12$ $y - 3x + 9 = 0$	Rearranging second equation to $y = 3x - 9$ Substitution of $(3x - 9)$ into equation one Correct expansion of bracket, e.g. $3x^2 - 9x = 12$ $3x^2 - 9x - 12 = 0$ Solving for x correctly (4 and -1) Correct substitution of x back into either equations Correct final answer: $x = 4$, $y = 3$ **and** $x = -1$, $y = -12$	**(1)** **(1)** **(1)** **(1)** **(1)**
2)	Solve the simultaneous equations $a^2 + b^2 = 20$ $b + 10 = 2a$	Clear attempt for substitution of $2a - 10$ into first equation Correct expansion of at least 3 terms of $(2a - 10)^2$ $4a^2 - 20a - 20a + 100$ **oe** Simplifying to : $5a^2 - 40a + 80 = 0$ **or** $a^2 - 8a + 16 = 0$ Correct substitution of a back into either equations for b Correct final answer: $a = 4$, $b = -2$	**(1)** **(1)** **(1)** **(1)** **(1)**

GCSE Exam Questions: Quadratic Simultaneous Equations Answers

	Question	Answer	Marks
3)	Solve the simultaneous equations $x^2 - 4y^2 = 9$ $3x + 4y = 7$	Method to find an expression for y to substitute into first equations E.g $y = \frac{7-3x}{4}$ Correct substitution and expansion E.g. $x^2 - 4(\frac{49-42x+9x^2}{16}) = 9$ Or $4x^2 - 49 + 42x - 9x^2 = 36$ Correct attempt to form a quadratic equation E.g. $5x^2 - 42x + 85 = 0$ Correct method for solving quadratic equations Correct final answer: $x = 3.4$, $y = -0.8$ $x = 5$, $y = -2$	**(1)** **(1)** **(1)** **(1)** **(1)**
4)	Find the distance between the intersection of the two lines $y = 2x^2 - 3x - 10$ $2x - y + 2 = 0$	Eliminating one unknown E.g $2x + 2 = 2x^2 - 3x - 10$ Correctly rearranging equation to form a quadratic $2x^2 - 5x - 12 = 0$ Correct use of method to solve quadratic for one unknown E.g. completing the square, quadratic formula, or factorisation Use of substitution to find other variable Correct points of intersection seen (-1.5, -1) **and** (4,10) **or** $x = -\frac{3}{2}$, $y = -1$ **and** $x = 4$, $y = 10$ Method for distance between two points E.g. Pythagorean Theorem Correct final answer: 12.3 (to 3 sf)	**(1)** **(1)** **(1)** **(1)** **(1)** **(1)**

Where to go next?

For more diagnostic questions, and GCSE maths revision resources and worksheets to support students in fixing any misconceptions take a look at the free Third Space Learning GCSE maths revision pages.

Scan the QR code to discover our library of FREE GCSE maths revision resources

Do you have KS4 students who need additional support in maths?

Our specialist tutors will help students to develop the skills they need to succeed at GCSE in weekly one to one online revision lessons. Trusted by secondary schools across the UK.

Visit thirdspacelearning.com to find out more.

THIRD SPACE LEARNING