

Lesson 8

GCSE Mathematics Simultaneous Equations III

8.1 T E S T

- Expanding brackets, FOIL
- Gathering together like terms
- Rearranging equations into the form $f(x) = 0$
- Factorising quadratics
- Solving quadratic equations

You may use a calculator
95 marks in total are available

Question 1

Find all solutions, if any, to the following equations,

(i) $5x + 13 = -27$

[2 marks]

(ii) $\frac{x}{4} = 0.625$

[2 marks]

(iii) $\frac{3x}{7} + 8 = 14$

[2 marks]

(iv) $4(x + 7) = 44$

[2 marks]

(v) $x^2 = 25$

[2 marks]

(vi) $\sqrt{x} - 1 = 2$

[2 marks]

Question 2*GCSE, June 2011, paper 3H, Q3***(a)** Factorise

$$w^2 - 9w$$

[2 marks]**(b)** Solve

$$5x - 1 = 2x - 7$$

[3 marks]**(c)** Expand and simplify

$$(y - 7)(y + 3)$$

[2 marks]**Question 3***GCSE, June 2011, paper 4H, Q5***(a)** Simplify

(i) $a \times a \times a \times a$

[1 mark]

(ii) $5a \times 6b$

[1 mark]

(iii) $q^8 \times q^2$

[1 mark]**(b)** Solve

$$5 - 2y = 12$$

[2 marks]**(c)** Given that, $v = w^2 - 2w$ Work out the value of v when $w = 6$ **[2 marks]**

Question 4*GCSE, May 2008, paper 3H, Q9***(a)** Solve

$$7 (x - 1) = 5 - 2x$$

[3 marks]**(b) (i)** Solve the inequality

$$4x + 5 \leq 21$$

[2 marks]**(ii)** n is a positive integer.Write down all the values of n which satisfy

$$4n + 5 \leq 21$$

[2 marks]**Question 5***GCSE, November 2007, paper 3H, Q9***(a)** Expand

$$4 (v + 3)$$

[1 mark]**(b)** Simplify

$$\frac{w^3 \times w^7}{w^2}$$

[2 marks]**(c)** Solve the equation

$$\frac{17 - x}{7} = 3$$

[3 marks]**(d)** Solve the inequality

$$4y - 5 < 6$$

[2 marks]

Question 6*GCSE, May 2008, paper 3H, Q14***(a)** Factorise

$$10y - 15$$

[1 mark]**(b)** Factorise completely

$$9p^2q + 12pq^2$$

[2 marks]**(c) (i)** Factorise

$$x^2 + 6x - 16$$

[2 marks]**(ii)** Solve

$$x^2 + 6x - 16 = 0$$

[1 mark]**Question 7***GCSE, June 2011, paper 4H, Q12***(i)** Solve the inequality

$$2x + 13 \geq 6$$

[2 marks]**(ii)** n is a **negative** integer.Write down all the values of n which satisfy

$$2n + 13 \geq 6$$

[2 marks]**Question 8**

Expand the brackets and simplify

$$(x - 5)(x + 7)$$

[2 marks]

Question 9

Expand the brackets and simplify

$$(3x + 5)(2x + 1)$$

[2 marks]

Question 10

GCSE, November 2007, paper 3H, Q13 (b) (c)

Factorise

(a)

$$x^2 - x - 12$$

[2 marks]

(b)

$$3x^2 + 7x + 2$$

[2 marks]

Question 11

Solve the simultaneous equations

$$y = x^2$$

$$y = 5x + 36$$

Show clear algebraic working.

[5 marks]

Question 12

GCSE, June 2011, paper 4H, Q15 (a)

Simplify, $\frac{8 (x - 3)^2}{4 (x - 3)}$

[2 marks]

Question 13

GCSE, November 2007, paper 3H, Q16 (a)

Simplify, $\frac{x^2 - 3x}{2x - 6}$

[3 marks]

Question 14

Factorise,

(i) $y = 5x^2 + 12x + 4$

(ii) $y = 21x^2 - 10x + 1$

[4 marks]

Question 15

By first factorising, solve the following quadratic equations,

(i) $6x^2 + 11x - 10 = 0$

(ii) $12x^2 - 16x - 3 = 0$

[8 marks]

Question 16

The line $2y = x + 9$ intersect the curve $3x^2 + xy = 5$ at the points A and B .
Find the coordinates of A and the coordinates of B .
Show clear algebraic working.

[6 marks]

Question 17

IGCSE Examination Question from January 2021, Paper 1HR, Question 17 (Edexcel)
Solve the simultaneous equations,

$$x - 6y = 5$$

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

Show clear algebraic working.

[5 marks]

Question 18

GCSE, June 2011, paper 3H, Q22

Solve the simultaneous equations

$$y = 2x - 3$$

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

[6 marks]

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