Lesson 7

GCSE Mathematics

Simultaneous Equations III

7.1 Exam Bits

This is a collection of examination questions that involve the five topics we've been looking at. Often a question is testing just one of the five.

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

7.2 Exercise

Question 1

GCSE, May 2008, paper 4H, Q1

(a) Solve

$$6x + 13 = 2x + 7$$

[3 marks]

(b) Solve

$$\frac{y}{5} - 2 = 4$$

[2 marks]

Question 2

GCSE, November 2006, paper 3H, Q7

Solve the inequality

$$9x - 2 < 5x + 4$$

[3 marks]

Question 3

GCSE, June 2010, paper 4H, Q4

(a) Multiply out

$$5(n + 6)$$

[1 marks]

(b) Simplify

$$y \times y \times y \times y \times y \times y$$

[1 marks]

(c) Solve

$$4(x - 2) = 3$$

[3 marks]

Question 4

GCSE, May 2007, paper 3H, Q6

(a) Expand and simplify

$$3(4x - 5) - 4(2x + 1)$$

[2 marks]

(b) Expand and simplify

$$(y + 8)(y + 3)$$

[2 marks]

(c) Expand

$$p\left(5p^2 + 4\right)$$

[2 marks]

Question 5

GCSE, May 2007, paper 3H, Q9

(a) Solve

$$5x - 4 = 2x + 7$$

[2 marks]

(b) Solve

$$\frac{7 - 2y}{4} = 2y + 3$$

[4 marks]

Question 6

GCSE, November 2010, paper 4H, Q20

Solve the simultaneous equations

$$y = x^2$$

$$y = 7x - 10$$

[5 marks]

Question 7

GCSE, June 2010, paper 4H, Q1

Solve

$$6y - 9 = 3y + 7$$

[3 marks]

Question 8

GCSE, June 2010, paper 4H, Q13(a)

Solve

$$x^2 - 8x + 12 = 0$$

[3 marks]

Question 9

GCSE, November 2010, paper 3H, Q13(a)

Factorise

$$x^2 - 8x + 15$$

[2 marks]

Question 10

GCSE, June 2009, paper 4H, Q16

(a) Factorise

$$2x^2 - x - 3$$

[2 marks]

(b) Hence write down the solutions of

$$2x^2 - x - 3 = 0$$

[1 mark]

Question 11

GCSE, November 2009, paper 3H, Q2

Solve

$$8y - 9 = 5y + 3$$

[3 marks]

Question 12

GCSE, November 2009, paper 3H, Q9

(a) Expand and simplify fully

$$2(w - 3) + 3(w + 5)$$

[2 marks]

(b) Solve the equation

$$\frac{x + 5}{3} = 9$$

[2 marks]

(c) Solve the inequality

$$5y + 7 < 13$$

[2 marks]

Question 13

GCSE, November 2009, paper 4H, Q12(a)

Expand and simplify

$$(p + 7)(p - 4)$$

[2 marks]

Question 14

GCSE, November 2009, paper 4H, Q2

(a) Factorise

$$n^2 - 4n$$

[2 marks]

(b) Solve

$$8 - 5x = 2$$

[3 marks]

Question 15

GCSE, May 2009, paper 3H, Q5

(a) Factorise

$$p^2 + 7p$$

[2 marks]

(b) Solve

$$4 - 5x = 2$$

[3 marks]

(c) Simplify

$$t^3 \times t^6$$

[1 mark]

(d) Expand and simplify

$$3(4y + 5) - 5(2y + 3)$$

[2 marks]

Question 16

GCSE, November 2008, paper 4H, Q17(a)

Factorise

$$2x^2 + 5x + 3$$

[2 marks]

Question 17

GCSE, November 2008, paper 4H, Q6

(a) Multiply out

$$5(x - 2)$$

[2 marks]

(b) Solve the equation

$$\frac{x}{4} + 3 = 10$$

[2 marks]

(c) Solve the inequality

$$5x - 6 > 2$$

[2 marks]

Question 18

GCSE, November 2008, paper 4H, Q6

Solve

$$5(x - 4) = 35$$

[3 marks]

Question 19

GCSE, November 2007, paper 4H, Q2

(a) Factorise

$$5x - 20$$

[1 mark]

(b) Factorise

$$y^2 + 6y$$

[2 marks]

Question 20

GCSE, May 2006, paper 3H, Q13(a)

Expand and simplify

$$(3x - 5)(4x + 7)$$

[2 marks]

Question 21

GCSE, May 2006, paper 4H, Q2

(a) Factorise

$$3x^2 - 2x$$

[1 mark]

(b) Expand

$$y^3(y - 4)$$

[2 marks]

(c) Here is a formula used in physics

$$v = u + at$$

Find the value of t when $v = 30$, $u = 5$ and $a = 10$

[2 marks]

Question 22

GCSE, May 2006, paper 4H, Q8

(a) Solve

$$3\,(x + 4) = 27$$

[3 marks]

(b) Solve

$$y^2 - 2y - 120 = 0$$

[3 marks]

Question 23

GCSE, May 2006, paper 4H, Q12(a)

Factorise

$$3x^2 - 13x + 4$$

[2 marks]

Question 24

GCSE, May 2006, paper 4H, Q17

Solve the simultaneous equations;

$$y = 2x + 1$$
$$x^2 + y^2 = 13$$

[6 marks }