Simultaneous equations

1. Solve the simultaneous equations.

$5x + 3y = 22 \times 2$ $\quad 10x + 6y = 44$ $\quad \boldsymbol{A}$
$2x + 4y = 20 \times 5$ $\quad 10x + 20y = 100$ $\quad \mathbf{B}$

Do not use trial and improvement.

$B - A \quad 14y = 56$
$y = 4$

$5x + 3(4) = 22$
$x = 2$

(3 marks)

2. Solve the simultaneous equations

$4x - 4y = 8 \times 3$ $\quad 12x - 12y = 24$ $\quad \boldsymbol{A}$
$5x - 3y = 18 \times 4$ $\quad 20x - 12y = 72$ $\quad \mathbf{B}$

Do not use trial and improvement.

$B - A \quad 8x = 48$
$x = 6$

$5(6) - 3y = 18$
$y = 4$

(3 marks)

Simultaneous equations

3. Solve the simultaneous equations

$5x - 6y = 28 \times 2 \quad 10x - 12y = 56 \quad \boldsymbol{A}$
$4x - 4y = 24 \times 3 \quad 12x - 12y = 72 \quad \mathbf{B}$

Do not use trial and improvement.

$B - A \quad 2x = 16$
$x = 8$

$5(8) - 6y = 28$
$y = 2$

(3 marks)

4. Solve the simultaneous equations

$6a + 2b = -2 \times 3 \quad 18a + 6b = -6 \quad \boldsymbol{A}$
$4a - 3b = 29 \times 2 \quad 8a - 6b = 58 \quad \mathbf{B}$

Do not use trial and improvement.

$B + A \quad 26a = 52$
$a = 2$

$6(2) + 2b = -2$
$b = -7$

(3 marks)

Simultaneous equations

5. Solve the simultaneous equations

$10x - 6y = 66 \times 3$ $\quad 30x - 18y = 198$ $\quad$ ***A***

$3x - 9y = 63 \times 2$ $\quad 6x - 18y = 126$ $\quad$ **B**

Do not use trial and improvement.

$A - B \quad 24x = 72$

$x = 3$

$10(3) - 6y = 66$

$y = -6$

(3 marks)

6. Solve the simultaneous equations

$4c + 2d = -14 \times 6$ $\quad 24c + 12b = -84$ $\quad$ ***A***

$3c - 12d = 30 \times 1$ $\quad 3c - 12b = 30$ $\quad$ **B**

Do not use trial and improvement.

$A + B \quad 27c = -54$

$c = -2$

$4(-2) + 2d = -14$

$d = -3$

(3 marks)

Simultaneous equations

7. Solve the simultaneous equations

$10x - 15y = 25$ $\times 1$ $\quad 10x - 15y = 25$ $\quad$ **A**

$x - 2y = 1$ $\times 10$ $\quad 10x - 20y = 10$ $\quad$ **B**

Do not use trial and improvement.

$$A - B \qquad 5y = 15$$
$$y = 3$$

$$x - 2(3) = 1$$
$$x = 7$$

(3 marks)

8. Solve the simultaneous equations

$2x - 8 = 2y$ $2x - 2y = 8$ $\times 1$ $\quad 2x - 2y = 8$ $\quad$ **A**

$x + 3y = 12$ $\quad \times 2$ $\quad 2x + 6y = 24$ $\quad$ **B**

Do not use trial and improvement.

$$A - B \qquad -8y = -16$$
$$y = 2$$

$$x + 3(2) = 12$$
$$x = 6$$

(4 marks)

Simultaneous equations

9. Solve the simultaneous equations

$x + 3y = 2 \quad \times 2 \quad 2x + 6y = 4 \quad \boldsymbol{A}$

$2x = 4y + 24 \quad 2x - 4y = 24 \quad \times 2 \quad 2x - 4y = 24 \quad \mathbf{B}$

Do not use trial and improvement.

$A - B \quad 10y = -20$

$y = -2$

$x + 3(-2) = 2$

$x = 8$

(4 marks)

10. The cost of buying 3 adult tickets and 8 child tickets at the theatre is £97.
The cost of buying 2 adult tickets and 4 child tickets at the theatre is £58.
Work out the total cost of 2 adult tickets and 1 child ticket.

$3a + 8c = 97 \times 2 \quad 6a + 16c = 194 \quad \boldsymbol{A}$

$2a + 4c = 58 \times 3 \quad 6a + 12c = 174 \quad \boldsymbol{B}$

$A - B \quad 4c = 20$

$c = 5$

$3a + 8(5) = 97$

$a = 19$

$Total: 19 + 19 + 5 = £43$

(4 marks)

Simultaneous equations

11. The cost of buying 4 plates and 2 cups is £34.
The cost of buying 3 plates and 1 cup is £21.
Work out the total cost of 4 plates and 4 cups.

$$4p + 2c = 34 \times 1 \qquad 4p + 2c = 34 \quad \boldsymbol{A}$$
$$3p + c = 21 \times 2 \qquad 6p + 2c = 42 \quad \boldsymbol{B}$$

$$B - A \qquad 2p = 20$$
$$p = 4$$

$$3(4) + c = 21$$
$$c = 9$$

$$Total: (4 \times 4) + (9 \times 4) = £52$$

(4 marks)

12. Sarah wants to buy some fruit.
She buys 5 bananas and 3 apples for £2.25.
She buys 3 bananas and 7 apples for £3.17.
Work out the cost of a banana and an apple.

$$5b + 3a = 2.25 \times 7 \qquad 35b + 21a = 15.75 \quad \boldsymbol{A}$$
$$3b + 7a = 3.17 \times 3 \qquad 9b + 21a = 9.51 \quad \boldsymbol{B}$$

$$A - B \qquad 26b = 6.24$$
$$banana = £0.24$$

$$3(0.24) + 7a = 3.17$$
$$apple = £0.35$$

(4 marks)

Simultaneous equations

13. Phillip wants to buy some stationary for school.
He buys 8 pens and 5 pencils for £3.41.
She buys 9 pens and 2 pencils for £3.22.
Work out the cost of a pen and a pencil.

$8p + 5c = 3.41 \times 2$ $\quad 16p + 10c = 6.82$ $\quad \boldsymbol{A}$

$9p + 2c = 3.22 \times 5$ $\quad 45p + 10c = 16.10$ $\quad \boldsymbol{B}$

$B - A \quad 29p = 9.28$

$pen = £0.32$

$8(0.32) + 5c = 3.41$

$c(pencil) = £0.17$

$Total: (4 \times 4) + (9 \times 4) = £52$

(4 marks)