

Simultaneous Equations Worksheet

Solving Linear Simultaneous Equations Algebraically

I Do

Solve the simultaneous equations:

$$3x + 2y = 16$$

$$4x - 3y = 27$$

Show clear algebraic working.

We Do

Solve the simultaneous equations:

$$2x + 5y = 16$$

$$3x - 2y = 5$$

Show clear algebraic working.

You Do

Solve the simultaneous equations:

$$5x + 3y = 11$$

$$2x - 4y = 20$$

Show clear algebraic working.

Challenge

Solve the simultaneous equations:

$$3x + 4y = 2$$

$$5x - 2y = 12$$

Show clear algebraic working.

Answers & Worked Solutions

• I Do:

Multiply eq 1 by 3: $9x + 6y = 48$

Multiply eq 2 by 2: $8x - 6y = 54$

Add equations to eliminate y: $17x = 102 \implies x = 6$

Substitute $x = 6$ into eq 1: $3(6) + 2y = 16 \implies 18 + 2y = 16 \implies 2y = -2 \implies y = -1$

Answer: $x = 6, y = -1$

• We Do:

Multiply eq 1 by 2: $4x + 10y = 32$

Multiply eq 2 by 5: $15x - 10y = 25$

Add equations: $19x = 57 \implies x = 3$

Substitute $x = 3$ into eq 1: $2(3) + 5y = 16 \implies 6 + 5y = 16 \implies 5y = 10 \implies y = 2$

Answer: $x = 3, y = 2$

• **You Do:**

Multiply eq 1 by 4: $20x + 12y = 44$

Multiply eq 2 by 3: $6x - 12y = 60$

Add equations: $26x = 104 \implies x = 4$

Substitute $x = 4$ into eq 1: $5(4) + 3y = 11 \implies 20 + 3y = 11 \implies 3y = -9 \implies y = -3$

Answer: $x = 4, y = -3$

• **Challenge:**

Multiply eq 2 by 2: $10x - 4y = 24$

Equation 1: $3x + 4y = 2$

Add equations: $13x = 26 \implies x = 2$

Substitute $x = 2$ into eq 1: $3(2) + 4y = 2 \implies 6 + 4y = 2 \implies 4y = -4 \implies y = -1$

Answer: $x = 2, y = -1$