A close-up, shallow depth-of-field photograph of a computer keyboard. The central focus is on a single key marked with a white 'x', a vertical slash, and a hyphen. The surrounding keys, including those with blue backlighting in the upper left and a plus/equals key in the lower right, are blurred. The overall color palette is muted, with greys and blacks of the keyboard contrasting with the white text and symbols.

Algebra - quadratics

Expanding and factorising

Blue Zone



Going slow

E.g. sad, sick, tired,
bored

Green Zone



Good to go

E.g. happy, calm,
focused, ok

Yellow Zone



Caution

Starting to lose control

E.g. worried, excited,
annoyed

Red Zone



Stop!

Out of control

E.g. angry, terrified,
elated

4. Solve the simultaneous equations

$$4x + y = -1$$

$$4x - 3y = 7$$

Here is a GCSE
question...

$x = \dots\dots\dots$ $y = \dots\dots\dots$

(Total 3 marks)

When Co-Efficient's are not the same...

Example 1: Solve: $3x + 3y = 18$ (1)
 $5x + y = -2$ (2)

**SAME SIGN
SUBTRACT**

Step 1: When neither co-efficient's are the same we **multiply** one or both equations to make them the same...

Multiply equation (2) by x3

$$15x + 3y = -6 \text{ (3)}$$

We call this equation (3)

We use the original equation 1 and new equation 3.

Step 2: Eliminate the letter with the same co-efficient (*by SUBTRACTING in this question*)

$$\begin{array}{r} (3) \ 15x + 3y = -6 \\ (1) \ 3x + 3y = 18 \quad - \\ \hline 12x \qquad \qquad = -24 \end{array}$$

($\div 12$)

$$x = -2$$

When Co-Efficient's are not the same...

Example 1:

Solve: $3x + 3y = 18$ (1)


$5x + y = -2$ (2)

Step 3: To find y , we substitute $x = -2$ back into one of the original equations (*equation 1*)

$$\begin{aligned}(3 \times -2) + 3y &= 18 \\ -6 + 3y &= 18 \\ (+ 6) \\ 3y &= 24 \\ (\div 3) \\ y &= 8\end{aligned}$$

Step 4: Check your answers using equation 2

$x = -2, y = 8$

$$\begin{aligned}(5 \times -2) + 8 &= -2 \\ -10 + 8 &= -2 \\ &= -2\end{aligned}$$


When Co-Efficient's are not the same...

Eg 2: **Solve:** $3x + 4y = 7$ (1)
 $5x - 2y = 16$ (2)

**DIFFERENT
SIGN ADD**

Step 1: When neither co-efficient's are the same we **multiply** one or both equations to make them the same...

Multiply equation (2) by x2

$$10x - 4y = 32 \text{ (3)}$$

We call this equation (3)

***We use the original equation 1
and new equation 3.***

Step 2: Eliminate the letter with the same co-efficient (*by SUBTRACTING in this question*)

$$\begin{array}{r} (1) \ 3x + 4y = 7 \\ (3) \ 10x - 4y = 32 \quad + \\ \hline 13x \qquad \qquad = 39 \\ (\div 13) \\ x = 3 \end{array}$$

When Co-Efficient's are not the same...

Eg2: **Solve:** $3x + 4y = 7$ (1)
 $5x - 2y = 16$ (2)

Step 3: To find y , we substitute $x = 3$ back into one of the *original* equations (*equation 1*)

$$\begin{aligned}(3 \times 3) + 4y &= 7 \\ 9 + 4y &= 7 \\ &(- 9) \\ 4y &= -2 \\ &(\div 4) \\ y &= -0.5\end{aligned}$$

Step 4: Check your answers using the *original* (equation 2)

$$x = 3, y = -0.5$$

$$\begin{aligned}(5 \times 3) - (2 \times -0.5) &= 16 \\ 15 - -1 &= 16\end{aligned}$$

$$16 = 16$$



When Co-Efficient's are not the same...

Eg3: **Solve:** $x + 4y = 6$ (1)
 $3x - 2y = 4$ (2)

***DIFFERENT
SIGN ADD***

Step 1: When neither co-efficient's are the same we **multiply** one or both equations to make them the same...

Multiply equation (2) by x2

$$6x - 4y = 8 \text{ (3)}$$

We call this equation (3)

***We use the original equation 1
and new equation 3.***

Step 2: Eliminate the letter with the same co-efficient (*by ADDING in this question*)

$$\begin{array}{rcl} (1) & x + 4y & = 6 \\ (3) & 6x - 4y & = 8 \quad + \\ \hline & 7x & = 14 \\ & (\div 7) & \\ & x & = 2 \end{array}$$

When Co-Efficient's are not the same...

Eg3: **Solve:** $x + 4y = 6$ (1)
 $3x - 2y = 4$ (2)

Step 3: To find y , we substitute $x = 2$ back into one of the **original** equations (*equation 1*)

$$\begin{aligned} 2 + 4y &= 6 \\ (- 2) \\ 4y &= 4 \\ (\div 4) \\ y &= 1 \end{aligned}$$

Step 4: Check your answers using the **original** (equation 2)

$$x = 2, y = 1$$

$$\begin{aligned} (3 \times 2) - (2 \times 1) &= 4 \\ 6 - 2 &= 4 \\ 4 &= 4 \end{aligned}$$



Solve:

a) $5x + 2y = 20$
 $2x + 4y = 24$

b) $3x + 2y = 26$
 $4x - y = 20$

Solve:

c) $2x + 9y = 69$
 $x + 3y = 24$

d) $4x + 3y = 19$
 $3x - 4y = 8$

Extension – Solve:

$$4x + 6y = 5$$
$$3x + 4y = 4$$

Extension 2 – Solve:

$$6x = 52 - 2y$$
$$5x + 7y = 70$$

A1 - Solve:

a) $4x - 3y = 14$
 $2x + 2y = -7$

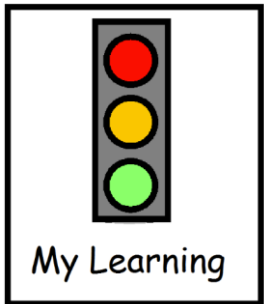
b) $7x - 2y = 13$
 $4x - 3y = 13$

A2 - Solve:

a) $2x + 9y = 69$
 $x + 3y = 24$

b) $4x + 3y = 19$
 $3x - 4y = 8$

Extension: Zach has 10p and 20p coins in a jar.
There are a total of 18 coins which add up to £2.30.
Work out the number of 10p and 20p coins Zach has.



Traffic light your work today.

Thumbs down- I don't understand it

Thumbs across- I understand some of it

Thumbs up- I understand all of it

A further task will be on the website for you to complete later today – one merit for all who do

