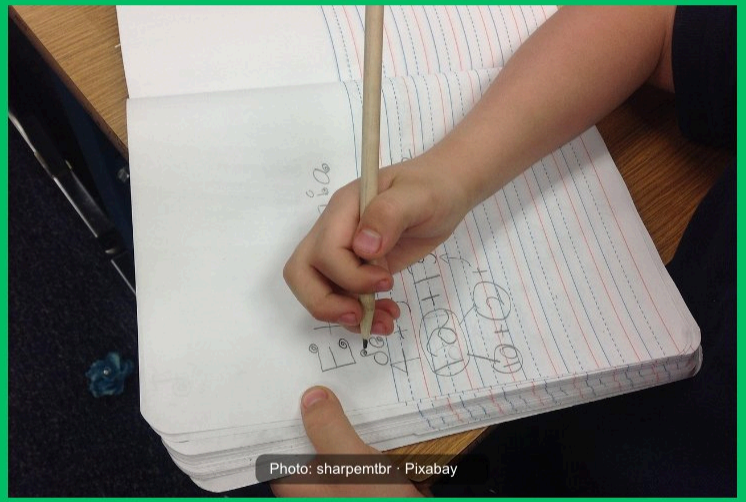
Solving Linear Equations

Find the mystery number with algebra



Created with LessonDino.com · AI lesson planner with checkable sources

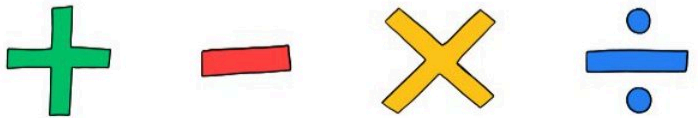
Today we will...

WE ARE LEARNING TO

- Use inverse operations to keep equations balanced
- Solve equations with brackets and unknowns on both sides

SUCCESS LOOKS LIKE

- ✓ I can rearrange and isolate x
- ✓ I can check my solution by substitution



Created with LessonDino.com · AI lesson planner with checkable sources

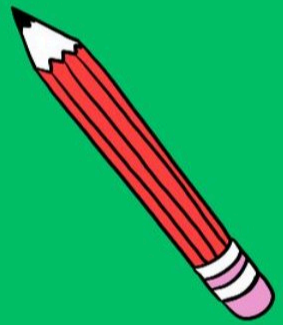
$a^2+b^2=c^2$

What makes an equation linear?

- one-step: x + 7 = 18
- x both sides
- check the balance

Linear equations

- two-step: 5x + 11 = 22
- brackets to expand



Created with LessonDino.com · AI lesson planner with checkable sources

Key words

equation

Two expressions equal, linked by =.

variable

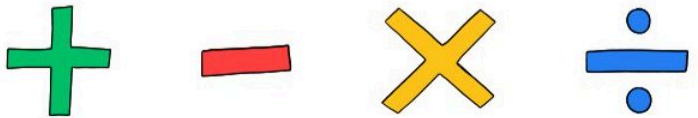
Letter standing for an unknown number.

inverse operation

Opposite that undoes a step.

solution

Value that makes both sides balance.



Created with LessonDino.com · AI lesson planner with checkable sources

$a^2+b^2=c^2$

What could this be?

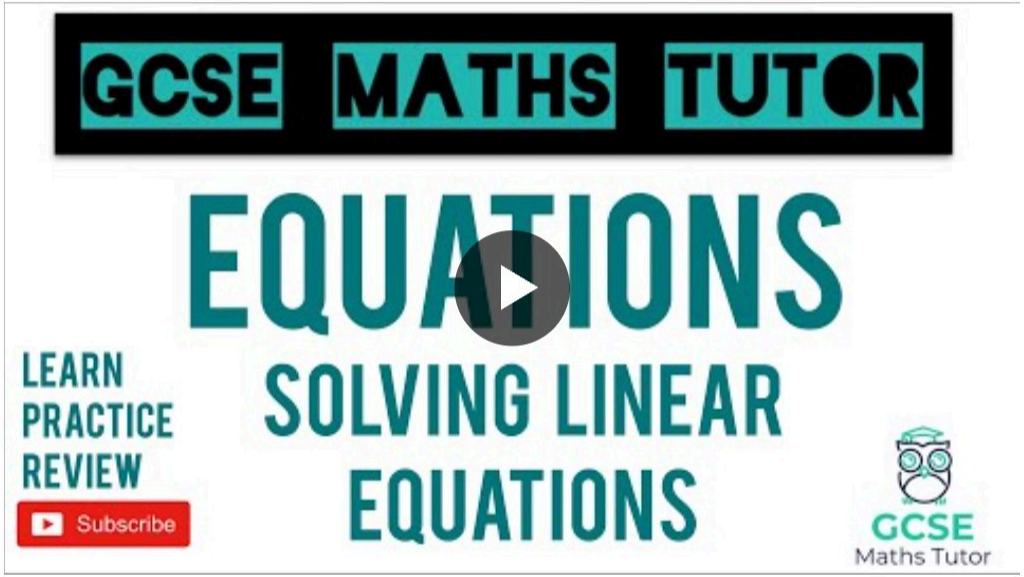
What does this keep balanced, and how is it like an equation?





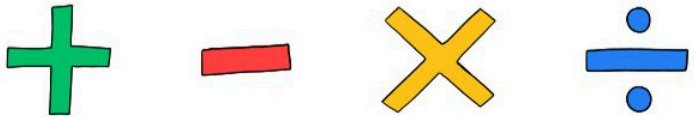
Created with LessonDino.com · AI lesson planner with checkable sources

Watch: balancing in action



▶ 0:00 – 4:40

- Spot each inverse operation used
- Notice add and subtract before multiply and divide
- Try 3x + 8 = 15 as you watch

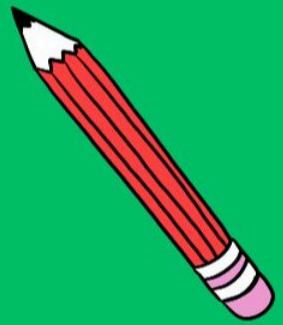


Created with LessonDino.com · AI lesson planner with checkable sources

$a^2+b^2=c^2$

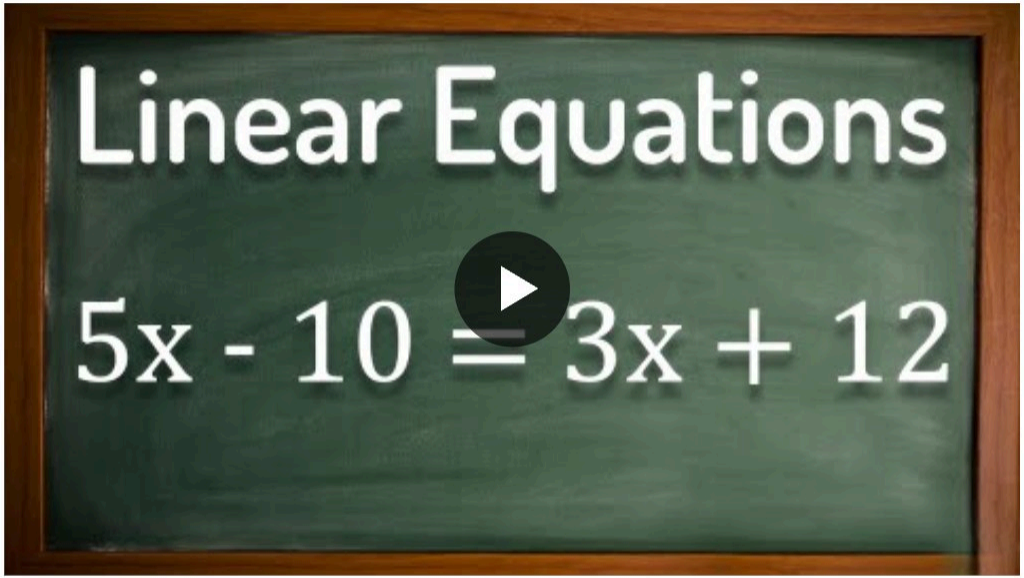
Solve it in 4 moves

1. Simplify: expand brackets, collect like terms
2. Gather x terms one side, numbers other
3. Undo + and - then x and ÷
4. Check by substituting back in



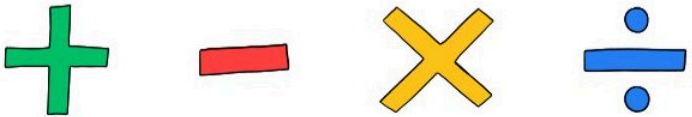
Created with LessonDino.com · AI lesson planner with checkable sources

Watch: x on both sides



▶ 0:00 – 4:58

- See how x terms move together first
- Listen for change side, change sign idea
- Check 13x - 2 = 11x + 17 with them



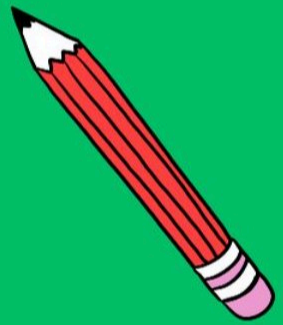
$a^2+b^2=c^2$

Your task

Work through the equation ladder, then compare methods with your partner.

1. Solve 1: x + 7 = 18 and 4z = 16
2. Solve 2: 2x + 5 = 13 and 5x - 3 = 2x + 9
3. Solve 3: 3(x + 4) = 27 and 13x - 2 = 11x + 17
4. Substitute each answer to prove it balances

10 min



Created with LessonDino.com · AI lesson planner with checkable sources

Four types to crack

Two-step

2x + 5 = 13 needs two inverse moves.

Both sides

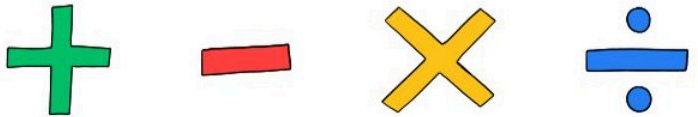
5x - 3 = 2x + 9 gather x together.

Brackets

3(x + 4) = 27 expand, then solve.

Fraction

(x + 1) / 2 = 6 multiply by 2 first.



Created with LessonDino.com · AI lesson planner with checkable sources

$a^2+b^2=c^2$

Think, pair, share

A student solves 5x + 11 = 22 as x = 33 / 5. What went wrong and what is x?





Created with LessonDino.com · AI lesson planner with checkable sources

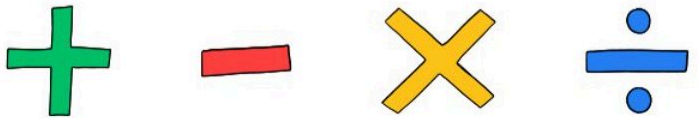
True or false?

In 5x + 11 = 22, first subtract 11 from both sides.

7y + 15 = 4y + 33 solves to y = 11.

3t - 2 = 0 is a linear equation.

You can check by substituting back in.



Created with LessonDino.com · AI lesson planner with checkable sources