Year 7 higher topic 7

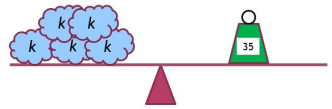
Equations

What careers would use these skills?

Police collision investigator, astronomer, astrologist, NASA scientist, chemist, doctor, physicist, business owner, builder

Solving simple equations

In an equation, the expressions on both sides of the equals sign have the same value, like a balanced set of scales. To stay balanced, do the same operation on both sides.

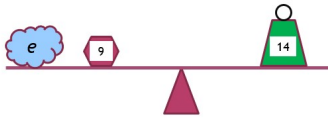


$5k = 35$

÷5 ÷5

Now solve the equation

$k = 7$



$e + 9 = 14$

-9 -9

Now solve the equation

$e = 5$

Writing simple equations

An equation involves an unknown number (a letter) and an '=' sign. You can write (and solve) an equation using the information you are give. For example, **Jack is 3 years older than Joe, so Joe is *n* years old and Jack is *n* + 3 years old.**

I think of a number (n), multiply it by 3 and add 2. **3n + 2**

My new number is 23. Write an equation and solve it.

3n + 2 = 23

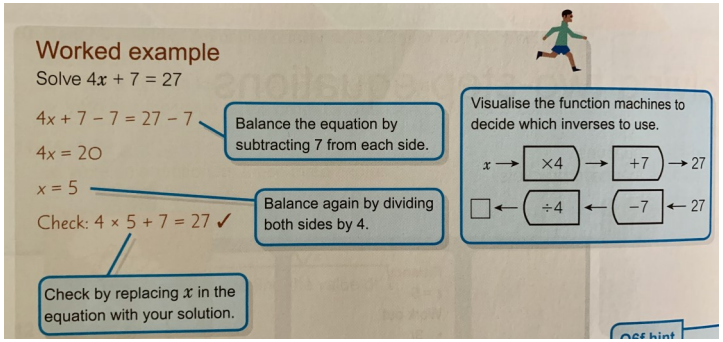
-2 - 2

3n = 21

÷3 ÷3

n = 7

Two-step equations



Trial and improvement

To use trial and improvement to solve an equation:

Estimate a value (choose a sensible number!)
Try your value in the equation. Is your answer too big or too small?

Use this to help you improve your estimate and try again.

Keep improving your estimate until you get very close to the value.

Equations with brackets

Start by expanding the brackets, then eliminate your smallest variable

$3(x + 4) = 27$

$3x + 12 = 27$

$-12 \quad -12$

Remember in order to eliminate a variable, you have to do the opposite, e.g. to get rid of 8x, you have to **subtract** 8x from both sides .

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

$10x + 4 = 8x + 12$

$-8x \quad -8x$

$2x + 4 = 12$

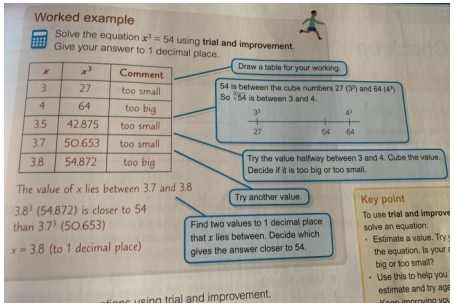
$-4 \quad -4$

$2x = 8$

$÷2 \quad ÷2$

$x = 4$

Solving equations including X^2 and X^3



Complex equations

You want to find out what 'x' is so you have to eliminate the smallest unknown (4x)
You need to eliminate the smallest value now (2)
4x = 8 so 'x' (or 1x) = 8 ÷ 4

$8x + 2 = 4x + 10$

$-4x \quad -4x$

$4x + 2 = 10$

$-2 \quad -2$

$4x = 8$

$÷4 \quad ÷4$

$x = 2$