SOLVING EQUATIONS

LO: To solve one-step and two-step equations.

24 September 2025

Week 5, Day 3

24/09/2025

Solving Equations

02:00

LO: To solve one-step and two-step equations.

Key words: Equation, Algebraic, Product, Quotient, variable, Inverse, Transpose

Mental Maths

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MENTAL MATHS:

1. What number, increased by five, gives two?
2. What number, doubled, gives sixteen?
3. The sum of what number and five gives negative ten?
4. The sum of what number and negative five gives ten?
5. The sum of what number and negative five gives negative ten?
6. The product of what number and negative eight gives sixteen?

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1. What number, increased by five, gives two?	−3
2. What number, doubled, gives sixteen?	8
3. The sum of what number and five gives negative ten?	−15
4. The sum of what number and negative five gives ten?	15
5. The sum of what number and negative five gives negative ten?	−5
6. The product of what number and negative eight gives sixteen?	−2

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STARTER:

Ronald is x years old.
His friend Colin is 3 years older than than Ronald.
Colin is 19 years old.

(a) Write down an equation for this information.
(b) Solve your equation to find how old Ronald is.

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STARTER:

Ronald is x years old.
His friend Colin is 3 years older than than Ronald.
Colin is 19 years old.

(a) Write down an equation for this information.
(b) Solve your equation to find how old Ronald is.

(a) $x + 3 = 19$

(b) $x = 19 - 3$

$x = 16$

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GCSE/iGCSE Assessment Objective Specification – Foundation/Higher

✓

A	understand that symbols may be used to represent numbers in equations or variables in expressions and formulae
A	solve linear equations, with integer or fractional coefficients, in one unknown in which the unknown appears on either side or both sides of the equation
B	set up simple linear equations from given data

The three angles of a triangle are $a°$,
$(a + 10)°$, $(a + 20)°$.
Find the value of a

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KEY CONCEPT:

What are one-step equations?

A **one-step equation** is an algebraic equation you can solve in only one step. Once you've solved it, you've found the value of the variable that makes the equation true.

INVERSE OPERATION!

- Addition and subtraction
- Multiplication and division

Remember: The most important thing to remember is that whatever you do to one side of the equation, you have to do the same thing to the other side.

My Turn

LO: To solve one-step and two-step equations.

Solve for the variable in the following equation:

1) $k + 18 = 21$	

My Turn

LO: To solve one-step and two-step equations.

Solve for the variable in the following equation:

1) $k + 18 = 21$ $k = 21 - 18$ $k = 3$	

Your Turn

LO: To solve one-step and two-step equations.

Solve for the variable in the following equation:

1) $3x+2=14$	

Your Turn

LO: To solve one-step and two-step equations.

Solve for the variable in the following equation:

1) $3x+2=14$

$3x = 14 - 2$

$\frac{3x}{3} = \frac{12}{3}$

$x = 4$

Check:

$3x + 2 = 14$

$3(4) + 2 = 14$

$12 + 2 = 14$

$14 = 14$

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MINI PLENARY:

A teacher asked her class to solve the equation $2x - 1 = 7$.

Amanda wrote:

$2x - 1 = 7$
$2x - 1 - 1 = 7 - 1$
$2x = 6$
$2x - 2 = 6 - 2$
$x = 4$

Betsy wrote:

$2x - 1 = 7$
$2x - 1 + 1 = 7 + 1$
$2x = 8$
$2x \div 2 = 8 \div 2$
$x = 4$

When the teacher read out the correct answer of 4, both students ticked their work as correct.

(a) Which student used the correct method?

(b) Explain the mistakes the other student made.

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GCSE/iGCSE Assessment Objective Specification – Foundation/Higher

✓ **A** understand that symbols may be used to represent numbers in equations or variables in expressions and formulae

✓ **A** solve linear equations, with integer or fractional coefficients, in one unknown in which the unknown appears on either side or both sides of the equation

B set up simple linear equations from given data

The three angles of a triangle are $a°$,
$(a + 10)°$, $(a + 20)°$.
Find the value of a

Core Task

LO: To solve one-step and two-step equations.

Solve the equations to find x.

Task 1

Section A

1) $7x+9=23$
2) $5x+7=42$
3) $4x+3=51$
4) $9x+5=41$
5) $4x+2=34$
6) $11x+3=36$
7) $10x+2=72$
8) $7x+3=52$
9) $6x+5=17$
10) $4x+7=9$
11) $8x+11=15$
12) $4x+17=18$

Task 2

Section B

1) $1+6x=19$
2) $9+7x=30$
3) $3+2x=17$
4) $11+5x=71$
5) $5+3x=32$
6) $4+5x=44$
7) $23=x+8$
8) $28=3x+1$
9) $53=8x+5$
10) $13=11+4x$
11) $7=8x+3$
12) $12=7+15x$

Task 3

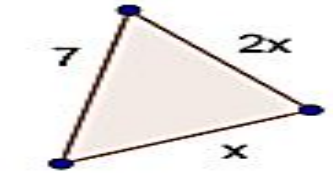
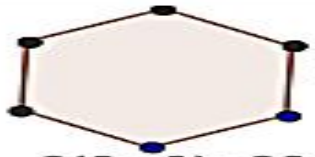
Section C

1) $4x-1=31$
2) $3x-4=29$
3) $6x-5=31$
4) $8x-2=46$
5) $2x-7=21$
6) $7x-3=18$
7) $9x-4=32$
8) $5x-1=64$
9) $12x-9=39$
10) $2x-1=2$
11) $4x-8=10$
12) $15x-2=3$

Extension

LO: To solve one-step and two-step equations.

10:00

$4x = 2$	$5(x+2)=30$	$2-4x=12+x$	 $x+2x+7=19$
$\frac{x+1}{4} = 3$	$7(2+x)=49$	$\frac{x}{3} - \frac{x}{4} = 1$	$X+2=1$
$2(x+3)=12$	$3(x+4)=2+x$	 $6(2x-3)=66$	$5(x-2)=3$
$\frac{2x-1}{3} = 5$	$2(2x-1)=5$	$5(3x+2)=25$	$4-3(x-2)=x$
$4(3+2x) = 5(x+2)$	$3x+8=x$	$x+5(2x-4)=2$	$\frac{x}{8} = \frac{3}{4}$
$\frac{x}{2} + \frac{2x}{3} = 5.25$	$3x=32-x$	$\frac{2x}{5} = -4$	$2(3-2x)=2(6-x)$

Plenary

LO: To solve one-step and two-step equations.

Solve: $8x - 5 = 43$

The answer is $x = 6$

TRUE	FALSE
Stand Up	Remain Seated

Plenary

LO: To solve one-step and two-step equations.

Solve: $-2x + 7 = -3$

The answer is $x = -5$

TRUE	FALSE
Stand Up	Remain Seated

Plenary

LO: To solve one-step and two-step equations.

Solve: $4(x - 5) = 4$

The answer is $x = -4$

TRUE	FALSE
Stand Up	Remain Seated

How do you feel?
S-Secure
M-Met
W-Working towards