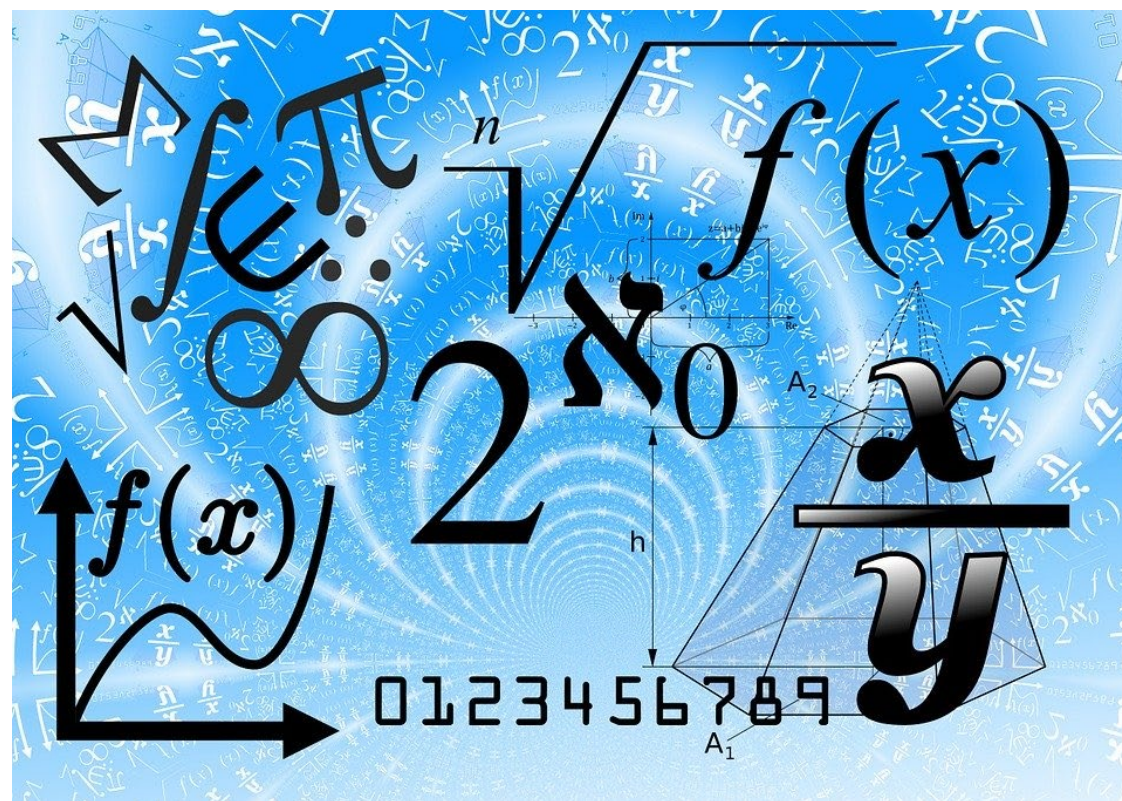


Algebra Revision

Part 1



Contents

- Worded algebra
- Substitution
- Simplifying (Addition and Subtraction)
- Simplifying (Multiplication and Division)
- Brackets
- Factorising



Worded Algebra

- Three times a number subtracted from 8

$$8 - 3x$$

- A number times itself added to 5 times another number gives 30

$$x^2 + 5y = 30$$

$$\begin{array}{l} 8-3x \\ x^2+5y=30 \end{array}$$

Have a go!

- A number multiplied by 7 then take away 4

$$7x - 4$$

- Divide a number by 3 then subtract it from 8

$$8 - x \div 3 \quad 8 - \frac{x}{3}$$

- A number multiplied by 2, then multiply the result by itself!

$$2x \times 2x = 4x^2$$



Substitution

- If $x = 5$, $y = 3$ and $z = -2$ then what are the values of

- $2x - y$ $2 \times 5 - 3 = 7$

- x^2y 75

- $2z - 3x$ $-4 - 15 = -19$

- $3x - 2z$ $15 - 2 \times (-2) = 19$



Have a go! If $a = 3$, $b = 4$ and $c = -4$ What are

- $3a + 5b$

$$3 \times 3 + 5 \times 4 = 29$$

- $ab^2 - c$

$$4 \times 8 - (-4) = 52$$

- $3c - 2b$

$$-12 - 8 = -20$$

- $a(2b + c^2)$

$$3(8 + 16) = 72$$



Simplifying 1 Adding and Subtracting (Collecting like terms)

- $5x + 3x$

$$8x$$

- $8x - y - 5x - 3y$

$$3x - 4y$$

- $7x^2 - 8y - 11x^2 + y$

$$-4x^2 - 7y$$



Simplifying 2 Multiplying

- $3y \times 2y$ $3 \times 2 \times y \times y = 6y^2$

- $5x^3y \times 3xy^2$ $15x^4y^3$

- $(4a^2)^3$ $4a^2 \times 4a^2 \times 4a^2 = 64a^6$



Simplifying 3 Dividing

- $8y \div 2y$

$$\frac{8y}{2y} = 4$$

- $10y^5 \div 4y^3$

$$\frac{10y^5}{4y^3} = \frac{5y^2}{2}$$

- $y^3 \div y^3 =$

$$1$$

- $6y^2 \div 3y^5$

$$= \frac{6y^2}{3y^5} = 2y^{-3} = \frac{2}{y^3}$$



Have a go

• $5x + 8y - 6x - 11y + y$

$-x - 2y$

• $8x^2y \times 3x^3yz^2$

$24x^5y^2z^2$

• $(3x^3)^3$

$27x^9$

• $\frac{8x^3y^5}{2xy^2}$

$4x^2y^3$



Brackets

- $3(5 + 2)$

$$3 \times 7 = 21$$

$$15 + 6 = 21$$

- $5(8y - 4)$

$$40y - 20$$

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

$$6x + 15 - (12x + 8) = -6x + 7$$

- $2x(x + 7) - 3(4x - 5)$

$$2x^2 + 14x - (12x + 15) = 2x^2 + 2x + 15$$



Factorising

- $8x + 6$

$$2(4x + 3)$$

- $12x^2 - 8x$

$$4x(3x - 2)$$

- $4x^2 + 12x^3$

$$4x^2(1 + 3x)$$

- $xy^2 + x^3y$

$$xy(y + x^2)$$



Quadratic Brackets and Factorising

- Expand and simplify $(x + 5)(x + 3)$

$$x^2 + 3x + 5x + 15 = x^2 + 8x + 15$$

- Factorise $x^2 + 8x + 15$

$$(x + 3)(x + 5)$$

- Factorise $x^2 + 12x + 35$

$$(x + 5)(x + 7)$$



Some Harder ones to have a go at

- Expand and simplify $(3x - 5)(2x - 3)$

$$6x^2 - 9x - 10x + 15 = 6x^2 - 19x + 15$$

- Factorise $x^2 - 7x - 30$

$$(x - 10)(x + 3)$$

- Factorise $x^2 - 7x + 12$

$$(x - 4)(x - 3)$$

