

## Review: Algebra & Solving Equations

Like terms have variables that are identical in every way *coefficient can be different*

Unlike terms have variables that are not the same

The distributive property allows you to multiply a term outside a bracket by each term inside the bracket

A polynomial is a mathematical expression containing terms being added and/or subtracted.

A polynomial with 2 terms is a binomial, and a polynomial with 3 terms is a trinomial.

A term is a number grouped with one or more variables. It is also known as a monomial.

### Simplifying Algebraic Expressions

1. Remove brackets. Use the distributive property where necessary:  $a(b + c) = ab + ac$ .
2. Collect like terms. *sign moves with term*
3. Add/subtract like terms. For multiplication/division, terms do NOT need to be like, just combine like bases.

$4x^2 + 6x - 3 + 4x - 10x^2 + 6$ $4x^2 - 10x^2 + 4x + 6x - 3 + 6$ $-6x^2 + 10x + 3$  <i>leave for now!</i>	$(3x^2 + 4y - 6) - (10x^2 - 12y - 1)$ $3x^2 + 4y - 6 - 10x^2 + 12y + 1$ $-7x^2 + 16y - 5$	$(2y^2 + 5y + 2) - (-y^2 + 3y + 2)$ $2y^2 + 5y + 2 + y^2 - 3y - 2$ $3y^2 + 2y$
$15 - 3(x + 4xy) - 6(2x + 3xy)$ $15 - 3x - 12xy - 12x - 18xy$ $15 - 15x - 30xy$	$2(4x^2 + 6x - 3) + 6x^2$ $8x^2 + 12x - 6 + 6x^2$ $14x^2 + 12x - 6$	$(4x^2y)(3xy^4z)$ $12x^3y^5z$ <i>don't need to be like for multiplication</i>
$16xy^2 \div 8y$ $\frac{16xy^2}{8y} = 2xy$	$\frac{9x^3y^2 + 18xy - 6x^2y^3}{3xy}$ $3x^2y + 6 - 2xy^2$	$2x(3x - 1) - 4x(6x + 5)$ $6x^2 - 2x - 24x^2 - 20x$ $-18x^2 - 22x$

### Steps for solving equations:

1. Simplify both sides of the equation if possible.
  - remove brackets using the distributive property
  - remove fractions by multiplying every term by the LCD
2. Use inverse operations to group variables on one side of equation and constants on the other (BEDMAS backwards).
3. Use inverse operation to isolate variable.
4. Check your answer.

**Note:** Use proper form – there should be only 1 equal sign per line  
– all equal signs should line up vertically

### Examples

$$\begin{aligned} -8 &= 3n - 14 \\ +14 & \\ \hline 6 &= 3n \\ \frac{6}{3} &= \frac{3n}{3} \\ 2 &= n \end{aligned}$$

$$\begin{aligned} y + 6(y - 3) &= 5(y + 2) \\ y + 6y - 18 &= 5y + 10 \\ y + 6y - 5y &= 10 + 18 \\ 2y &= 28 \\ \frac{2y}{2} &= \frac{28}{2} \end{aligned}$$

$$\begin{aligned} \frac{3}{4}t - 2 &= 7 + 2 \\ \frac{3t}{4} &= 9 \\ 3t &= 36 \\ t &= \frac{36}{3} = 12 \end{aligned}$$

$$\begin{aligned} \frac{3x-2}{4} &= 5 \\ 1(3x-2) &= 20 \\ 3x-2 &= 20 \\ 3x &= 22 \\ x &= \frac{22}{3} \approx 7.3 \end{aligned}$$

$$\begin{aligned} \frac{3}{4}t - 2 &= \frac{1}{2}(t + 2) \\ \frac{3t}{4} - 2 &= \frac{1}{2}t + 1 \\ \frac{3t}{4} - \frac{2t}{2} &= \frac{1}{2}t + 1 + 2 \\ \frac{3t}{4} - \frac{4t}{4} &= \frac{1}{2}t + 3 \\ -\frac{t}{4} &= \frac{1}{2}t + 3 \\ -\frac{t}{4} - \frac{1}{2}t &= 3 \\ -\frac{3t}{4} &= 3 \\ -3t &= 12 \\ t &= -4 \end{aligned}$$