

Algebra Vocabulary

Terms	A term is separated by a + or - sign E.g: $5x-3y+2$ There are 3 terms in this equation: $5x$, $-3y$ and 2
Coefficient	The number in front. E.g: In the term $5y$, y 's coefficient is 5
Constant	Constant is the single number which does not have any letters or numbers attached to it.
Like terms	Terms including <i>exactly</i> the same letter or combination of letters. E.g: $6p$, $8p$ and $5p$ are like terms ab , $10ab$ and $-2ab$ are like terms
Unlike terms	Terms which have different letters or combination of letters. E.g: $3x$ and $3y$ are unlike terms

Simplifying Expressions

Rule	Example
Any numbers in the expression are multiplied.	$5 \times 6x = 30x$
Numbers are placed in front of letters when multiplying.	$x \times 3y = 3xy$
If there is more than one letter they are written in alphabetical order.	$2q \times 7p = 14pq$
Numbers can be multiplied separately, then multiply letters.	$6p \times 3p$ $= 6 \times 3 \times p \times p$ $= 18p^2$
Like terms can be grouped together and then added or subtracted.	Simplify: $2x + y - x + 8y$ $= (2x - x) + (y + 8y)$ $= x + 9y$
Remember , the + and - signs go with the terms on their <i>right</i> .	

Examples - Simplifying

$7 \times x = 7x$
 $x \div 5 = \frac{x}{5}$
 $7x + 2x = 9x$
 $3y - y = 2y$

Powers Rules

p^4 means p multiplied by itself <i>four</i> times	p^4 $= p \times p \times p \times p$
Simplify as powers and then multiply by each other	$x \times x \times y \times y$ $= x^2y^2$
When multiplying expressions with the same base (letter), we add the powers .	$x^2 \times x^5$ $= x^{2+5}$ $= x^7$
When dividing expressions with the same base , we can subtract the powers .	$20x^4 \div 10x$ $= 20x^{4-1} \div 10$ $= 2x^3$

Expanding

Multiply each term in the brackets by the outside term.
Then add together and simplify.

Examples:

$8(c + d - e)$	$4x(2x - 5)$
$= 8 \times c + 8 \times d - 8 \times e$	$= (4x \times 2x) + (4x \times -5)$
$= 8c + 8d - 8e$	$= 8x^2 - 20x$

Factorising

1) Find the Highest Common Factor (number that divides in all terms equally) of all terms. Write this outside the brackets.

2) Divide each term by the HCF, putting result in the brackets.

Note: The HCF could be a number or a letter.

Factorising Example

$30x - 18$
 $30: ①②③⑤⑥⑩⑱⑳$
 $18: ①②③⑥⑨⑱$
 HCF: 6
 Divide all terms by 6
 $30x \div 6 = 5x$
 $18 \div 6 = 3$
 $80 \dots 30x - 18 = 6(5x - 3)$

Solving Equations

The goal of solving an equation is to get the **letter term** on the **left** of the = sign and the **number/value** on the **right**.

Remember if a number or term is moved across the equals, then you must use the opposite operation.

Solving Examples

① $17x = 5x + 96$
 ① Move $5x$ to the LEFT.
 Change operation to $-$
 $17x - 5x = 96$
 ② Simplify
 $12x = 96$
 ③ Move 12 to the right.
 Change operation to \div
 $x = \frac{96}{12}$
 $x = 8$

② $4x - 5 = x + 13$
 $4x - x = 13 + 5$
 $3x = 18$
 $x = \frac{18}{3}$
 $x = 6$

Calculating a Fraction or Percentage of an amount

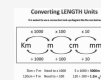
If calculating a fraction or percentage of an amount, multiply the amount by the fraction or percentage.

For example:

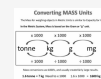
$$25\% \text{ of } \$250 = \$250 \times 25\% = \$62.50$$

$$1/3 \text{ of } 300 = 300 \times 1/3 = 100$$

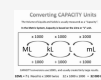
Measurement - Converting Length Units



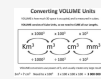
Measurement - Converting Mass/Weight Units



Measurement - Converting Capacity Units



Measurement - Converting Volume Units



Measurement - Converting Volume and Capacity



Converting Fractions, Decimals and Percentages

Percentages represent an amount out of 100

To convert, write the percentage as a fraction out of 100.

E.g: $65\% = 65/100$

This can then be simplified by dividing both numbers by their HCF.

$$65/100 = 13/20$$

(HCF of 65 and 100 is 5)

Decimals \leftrightarrow Percentages

Decimal to Percentage:

Divide % by 100 (or move decimal point to the left by two places)

$$65\% = 65 \div 100 = 0.65$$

Percentage to Decimal:

Multiply the decimal by 100 (or move decimal point to the right by two places)

$$0.74 = 0.74 \times 100 = 74\%$$

Fractions to decimals

Divide the numerator by the denominator:

$$2/3 = 2 \div 3 = 0.33333$$

Decimals to fractions

Take the decimal as an amount out of 10, 100, 100 etc depending on how many decimal places:

$$0.65 = 65/100 \text{ (2dp)}$$

$$0.625 = 625/1000 \text{ (3dp)}$$

From here you may be able to simplify further using HCF

Statistics - Calculations

Statistics

Mean = $\frac{\text{sum of results}}{\text{number of results}}$

Median = middle value when listed in order

Mode = most frequent value.

Minimum = lowest value.

Maximum = highest value.

Lower quartile = middle value between minimum and median

Upper quartile = middle value between maximum and median

Range = maximum - minimum

E.g.
 Mean
 Median
 Maximum
 Minimum
 Lower Quartile
 Upper Quartile
 Mode
 Range

Statistics - Example

A photograph of a whiteboard with handwritten statistics for the data set: 2, 3, 3, 7, 11, 12, 12, 12, 14, 15. The calculations shown are: Median = $\frac{11+12}{2} = 11.5$, Maximum = 15, Minimum = 2, LQ = 3, UQ = 12, Mode = 12, Range = $15 - 2 = 13$, and Mean = $\frac{2+3+3+7+11+12+12+12+14+15}{10} = \frac{91}{10} = 9.1$. A hint on the right says 'Look at the info about spread (link in Classroom)'. The whiteboard has a header with labels C7, D, Dm, D, E, Em, E7.

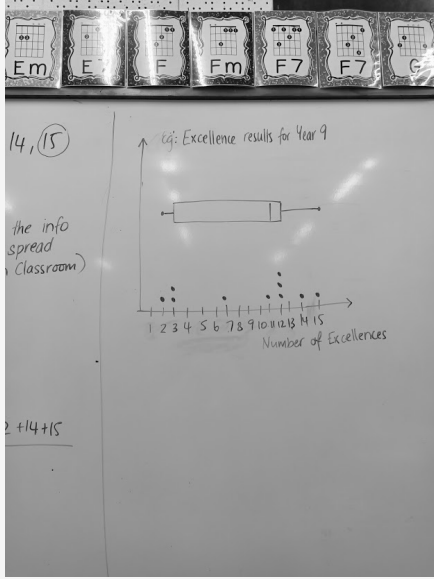
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Page 2 of 4.

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Statistics - Dot Plot/Box and Whisker



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Page 3 of 4.

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