

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	$x \times x \times y \times y$ $= x^2 y^2$
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

- Find the Highest Common Factor (number that divides in all terms equally) of all terms. Write this outside the brackets.
- Divide each term by the HCF, putting result in the brackets.

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

Factorising Example

$30x - 18$
 $30: 1, 2, 3, 5, 6, 10, 15, 30$
 $18: 1, 2, 3, 6, 9, 18$
 $HCF: 6$
 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 $4x - 5 = x + 13$
 $4x - x = 13 + 5$
 $3x = 18$
 $x = \frac{18}{3}$
 $x = 6$

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:
 $0.65 = 65/100$ (2dp)
 $0.625 = 625/1000$ (3dp)
 From here you may be able to simplify further using HCF

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



Statistics - Calculations

Statistics

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

Median = middle value when listed in order

Mode = most frequent value.

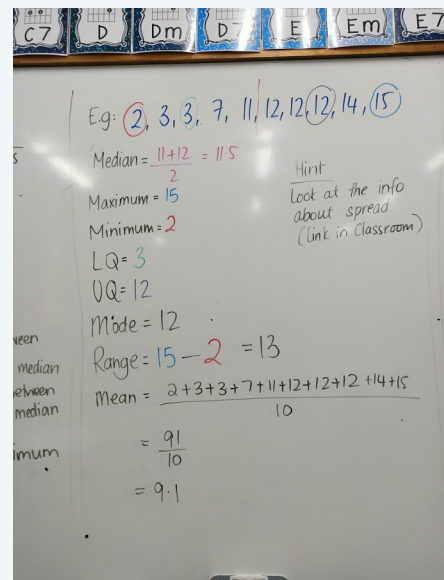
Minimum = lowest value.

Maximum = highest value.

Lower quartile = middle value between minimum and median

Upper quartile = middle value between maximum and median

Range = maximum - minimum



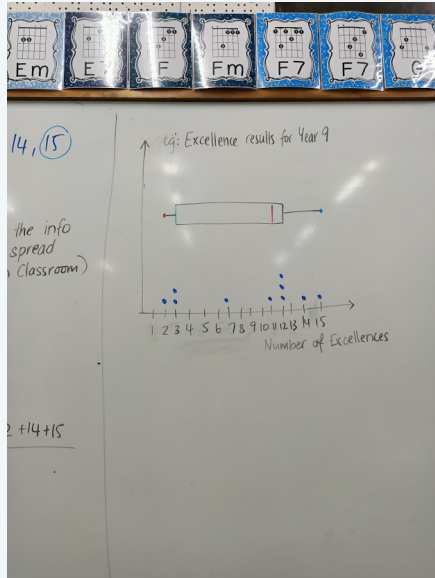
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Statistics - Dot Plot/Box and Whisker



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