

Maths Knowledge Organiser

YEAR 8 – PART 3

Key Language

1	Variable	A quantity that can take a range of values.
2	Coefficient	A number used to multiply a variable
3	Simplify	When we simplify an expression we write it in its most compact form e.g $2x + 3x$ simplifies to $5x$.
4	Substitute	Where you replace variables (letters) with other values. E.g. if $y = 2$ then substituting into $5y$ becomes $5 \times 2 = 10$.
5	Expand	Multiply each term in the bracket by the expression outside the bracket.
6	Product	The result of multiplying one number with another, or one term with another
7	Factor	Numbers or terms we can multiply together to get another number or term. E.g. 3 and $2x$ are factors of $6x$
8	Highest Common Factor	Highest common factor is the largest factor of two or more terms. Also known as HCF.
9	Factorise	Write an expression as a product involving the HCF of the terms. The opposite of expanding. E.g. $2y + 6 = 2(y + 3)$,
10	Unlike terms	Terms which cannot be collected together and simplified. E.g. $3x$ and $4y$ are not like terms.
11	Equation	A statement that two things are equal e.g. $5 = 2x + 1$
12	Solve	Find the value of the unknown in an equation.
13	Identity	An equation that holds true for all values of the variable. The symbol is \equiv .
14	Quadratic	An expression where the highest power of the variable is 2 e.g. $3x^2 + 5x$, $x^2 + 5x + 6$
15	Inequality	When one quantity is not equal to another.
16	Solution set	A set of all the solutions to an equation.
17	Sequence	A succession of terms formed according to a rule.
18	Terms	The numbers in a sequence
19	Term to term rule	The rule that you use to get from one term to the next.
20	Nth term rule	A formula to find any term in a sequence of numbers from its position in the sequence.
21	Linear Sequence	A number pattern that increases or decreases by the same value each time. This is known as the common difference
22	Non Linear Sequence	A number pattern which does not increase (or decrease) by a common difference.
23	Geometric Sequence	A sequence that multiplies (or divides) by the same value each time. This is called the common ratio.



Know

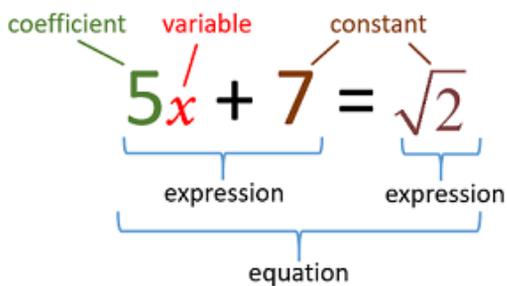
More Useful Knowledge



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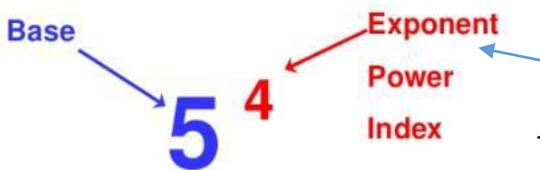
\neq	means not equal
$<$	less than
$>$	more than
\leq	less than or equal to
\geq	greater than or equal to

Algebraic definitions



Terms: $5x$, 7 , $\sqrt{2}$

Indices



These are all different words that mean the same thing.

The **index** of a number tells you how many times to multiply the number by itself
e.g. y^3 means $y \times y \times y$.

Sequences

Sequence:

3, 5, 7, 9, ...

1st term 2nd term 3rd term 4th term three dots means goes on forever (infinite)

This is an ascending sequence.
The common difference is 2

Know



1. Which part of this expression is the exponent? $4x^2$.
2. What type of sequence is this? 10, 20, 40, 80...
3. What is the rule called where you work out a term from its position in the sequence?
4. What symbol is used for an identity?
5. Write the correct symbol between x and 4 so that it means x is greater than or equal to 4 .
 x 4
6. Which of these are factors of $10xy$? 2 $8x$ $5x$ x^2 10 $10x$ 1 y $2y$ xy
7. What does 'simplify the expression' mean?
8. Which of these are like terms with $6x$? $2x$ x^6 x 6 $6y$
9. Which part of this expression is the constant? $3x^2 - 7.1$
10. What is a quadratic expression?
11. What is the opposite of expanding a bracket?
12. Expand $3(x + 4)$
13. What is it called when you find the value of the unknown in an equation?
14. What is a non-linear sequence.
15. What is the common ratio for this sequence? 4, 12, 36, 108, 324
16. Which part of this expression is the variable? $10p^2 - 3$
17. What is a coefficient?
18. Work out 2^4 .
19. What is the HCF of 24 and 42?
20. Write an inequality that says x multiplied by 2 is less than 19.
21. Substitute $x = 4$ into the expression $x^2 - 3$
22. Solve $3x + 2 > 13$
23. Write down the product of $2x$ and $3y$
24. What is a solution set?
25. Write the next two terms of this sequence where the term to term rule is $+1.5$.
6, __, __

ANSWERS

1. The 2 (power)
2. Geometric (also non-linear)
3. Nth term rule
4. \equiv
5. $x \geq 4$
6. 2, $5x$, 10, $10x$, 1, y , $2y$, xy
7. Collect like terms to write in most compact form.
8. $2x$, x
9. -7.1
10. An expression where the highest power of the variable is 2.
11. Factorising
12. $3x + 12$
13. Solve
14. A sequence that does not add or subtract the same value each time,
15. 3
16. p
17. The number that the variable is multiplied by.
18. 16
19. 6
20. $2x < 19$
21. 13
22. $x > 5$
23. $6xy$
24. A set of all the solutions to an equation or inequality
25. 7.5, 9

