Algebra Test Cheat Sheet

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Mordialloc College

Discovery 8F

Vocabulary

Expression: A number sentence without an equal sign. Has at least two terms and one operation.

Coefficient: A number that does not stand by itself. It is attached to the variable.

Constant: A number that stands by itself.

Term: Each part of an expression separated by an operation.

Variable: A letter that stands for a particular numerical value.

Reminders

The number comes before the letter.

You do not need to write the multiplication sign.

FOIL

First **O**utside **I**nside **L**ast

eg. (a + 4)(a + 7)

= a^2 + 7a + 4a + 28

= a^2 + 11a + 28

Substitution

To replace a pronumeral with a given value.

eg. 2y + 3

If y was1, then the expression would be

2 x 1 + 3

Expanding and Factorising Expressions

To expand an expression, multiply each term in the bracket by the number on the outside.

eg. 2(y + 2x) = 2y + 4x

To factorise an expression, find a common factor to place outside of the brackets.

eg. 3(2x + 7) = 6x + 21

Number Laws

Commutative Law

The Commutative Law refers to the order in which two numbers may be added, subtracted, multiplied or divided.

It holds true for addition and multiplication but not subtraction and division.

Associative Law

The Associative Law refers to the order in which three numbers may be added, subtracted, multiplied or divided, taking two at a time.

Like the Commutative Law, it holds true for addition and multiplication but not subtraction and division.

Identity Law

The Identity Law states that when a zero is added to a number/any number is multiplied by one, the original number remains unchanged.

Inverse Law

The Inverse states that when a number is added to its additive inverse/multiplied by its reciprocal, the result is one.

Inverse Operations and Backtracking

Inverse operations are reverse operations that undo each other.

Addition (+) and subtracting (-) are inverse operations. Multiplication (x) and division (÷) are also inverse operations.

When backtracking, you have to work backwards with reverse BODMAS and inverse operations.

eg. 2x - 3 = 19

19 + 3 ÷ 2 = x

∴ x = 10.5

Indices and Index Notation

Indices is the plural form of index. An index is a shorthand way of writing a repeated multiplication.

It is written as a small number to the right and above the base number.

The base is the number that is being multiplied and the index (plural indices) is the number of times it is multiplied.

In this example: 82 = 8 × 8 = 64

Other names for index are exponent or power.

Index notation is similar to expanded notation, but going one step further and writing multiples of 10 as indices.

eg. 3,657,428 in index notation would be (3 x 10^6) + (6 x 10^5) + (5 x 10^4) + (7 x 10^3) + (4 x 10^2) + (2 x 10^1) + (8 x 10^0).

Usually, indexes of 1 and 0 are not included in index notation. This is because 10^1 is equal to 10 and 10^0 is equal to 1.

Like and Unlike Terms

Terms containing exactly the same pronumerals, regardless of order, are called like terms.

Unlike terms are terms that have different variables.

Examples of like terms:

12 x and 7 x

12 and 7

12mno and 12mon

Examples of unlike terms:

12x and 7m

12x and 7

12x and 7x²

When simplifying expressions, we can add or subtract like terms only. Expressions which do not have like terms cannot be added or subtracted.

eg. 5**x** + 3**x** - 7 + 8**x** = 16**x** - 7

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