

## MATHS Unit 2

Making generalisations about the number system: how positive and negative numbers impact on our understanding of change

### RULES FOR ADDING AND SUBTRACTING NEGATIVE NUMBERS

The two minus signs becomes a plus.

To take away a negative, add instead

#### Examples

$$\begin{aligned} \text{a) } 2 + -5 &= 2 - 5 \\ &= -3 \end{aligned}$$

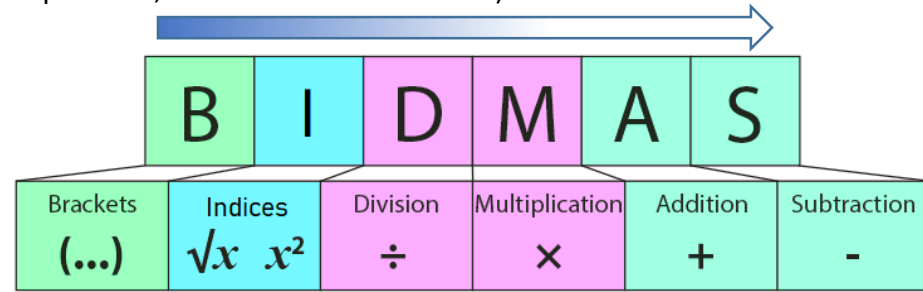
$$\begin{aligned} \text{b) } 2 - -5 &= 2 + 5 \\ &= 7 \end{aligned}$$

$$\begin{aligned} \text{c) } -2 + -5 &= -2 - 5 \\ &= -7 \end{aligned}$$

$$\begin{aligned} \text{d) } -2 - -5 &= -2 + 5 \\ &= 3 \end{aligned}$$

### ORDER OF OPERATION

When there is more than one operation, the order in which you apply them is (Brackets, Indices, Division, Multiplication, Addition and Subtraction)



### RULES FOR MULTIPLYING AND DIVIDING NEGATIVE NUMBERS

#### Multiplication Examples

$$\begin{aligned} \text{a) } 2 \times 5 &= 10 \\ \text{b) } 2 \times -5 &= -10 \\ \text{c) } -2 \times 5 &= -10 \\ \text{d) } -2 \times -5 &= 10 \end{aligned}$$

#### Multiplication and Division Rule

Signs of Two Numbers	Sign of the Answer (Product or Quotient)
the same	positive (+)
different	negative (-)

#### Division Examples

$$\begin{aligned} \text{a) } 15 \div 5 &= 3 \\ \text{b) } 15 \div -5 &= -3 \\ \text{c) } -15 \div 5 &= -3 \\ \text{d) } -15 \div -5 &= 3 \end{aligned}$$

### SEQUENCES

A **sequence** is an ordered list of **terms** that follow a particular pattern. Below are some keywords.

Keywords	Definition/Tips	Example
Linear Sequence	A number pattern with a common difference.	2, 5, 8, 11... is a linear sequence
Term	Each value in a sequence is called a term.	In the sequence 2, 5, 8, 11..., 8 is the third term of the sequence.
Term-to-term rule	A rule which allows you to find the next term in a sequence if you know the previous term.	First term is 2. Term-to-term rule is 'add 3' Sequence is: 2, 5, 8, 11...
nth term	A rule which allows you to calculate the term that is in the nth position of the sequence. Also known as the 'position-to-term' rule. n refers to the position of a term in a sequence.	nth term is $3n - 1$  The 100 <sup>th</sup> term is $3 \times 100 - 1 = 299$
Fibonacci type sequences	A sequence where the next number is found by adding up the previous two terms	The Fibonacci sequence is: 1,1,2,3,5,8,13,21,34 ... An example of a Fibonacci-type sequence is: 4, 7, 11, 18, 29 ...

## ALGEBRAIC NOTATIONS AND KEYWORDS

In Maths we use letter to represent unknown numbers and as short-hand writing.

### Example

“three dogs and two cats” can be written as “ $3d + 2c$ ” meaning “3 x dogs and 2 x cats”

Keywords	Definition/Tips	Example
Expression	A mathematical statement written using symbols, numbers or letters,	$3x + 2$ or $5y^2$
Equation	A statement showing that two expressions are equal	$2y - 17 = 15$
Formula	Shows the relationship between two or more variables	Area of a rectangle = length x width or $A = L \times W$
Simplifying Expressions	Collect 'like terms'. Be careful with negatives. $x^2$ and $x$ are not like terms.	$2x + 3y + 4x - 5y + 3$ $= 6x - 2y + 3$ $3x + 4 - x^2 + 2x - 1$ $= 5x - x^2 + 3$
$x$ times $x$	The answer is $x^2$ not $2x$ .	Squaring is multiplying by itself, not by 2.
$p \times p \times p$	The answer is $p^3$ not $3p$	If $p=2$ , then $p^3=2 \times 2 \times 2=8$ , not $2 \times 3=6$
$p + p + p$	The answer is $3p$ not $p^3$	If $p=2$ , then $2+2+2=6$ , not $2^3 = 8$

## DRAWING AND MEASURING ANGLES

How To Use a Protractor

**1** Place the cross or circle at the point (vertex) of the angle that you are measuring.

How To Use a Protractor

**2** Read from the zero on the outer scale of your protractor.

How To Use a Protractor

**3** Count the degree lines carefully.

How To Use a Protractor

**Tip!** It is a good idea to estimate the angle before measuring.

How To Use a Protractor

**1** Place the cross or circle at the point (vertex) of the angle that you are measuring.

**2** Read from the zero on the outer scale of your protractor.

**3** Count the degree lines carefully.

## Steps to Draw an Angle

• Draw a line

• Measure

• Mark

• Connect