PRINCIPLES - LESSON 1D
THE ORDER OF OPERATIONS

THE 4 BASIC OPERATIONS

#1. Tonsillectomy

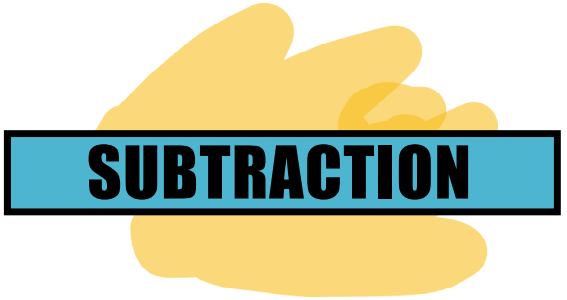
#2. Appendectomy

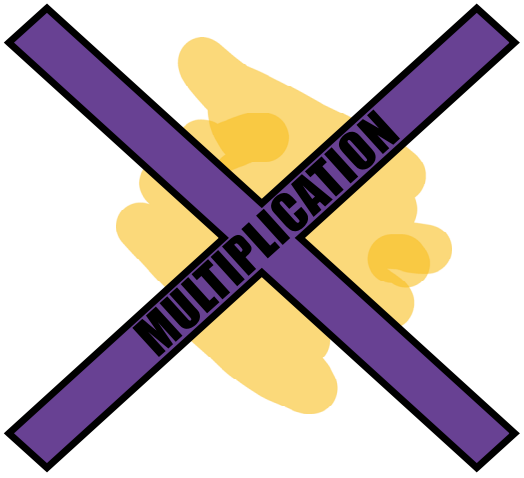
#3. Arthroscopy

#4. Rhinoplasty

Note: This is just a really bad joke, do not copy this into your notes.

FOUR BASIC OPERATIONS





HOW MANY ANSWERS WILL WE GET?

ex1) Simplify: $36 + 8 \div 4 \cdot 2 + 0 \cdot 8 - 7 \cdot 5$

We must all agree to perform operations in exactly the same order. Otherwise, we would all get different answers.

$36 + 2 \cdot 2 + 0 \cdot 8 - 7 \cdot 5$

$36 + 4 + 0 \cdot 8 - 7 \cdot 5$

$36 + 4 + 0 - 7 \cdot 5$

$36 + 4 + 0 - 35$

$40 + 0 - 35$

$40 - 35$

$= 5$

WHY WE NEED AN ORDER OF OPERATIONS

We all agree to perform operations in the same order so that we all get the same answer to a math problem.

What is the correct order of operations?

Is there a way to remember the order?

THE ORDER OF OPERATIONS

Aunt Sally

Please	**E**xcuse	**M**y	**D**ear	**A**unt	**S**ally
Parenthesis	**E**xponents	**M**ultiply	**D**ivide	**A**dd	**S**ubtract

JUST USE PEMDAS

Parenthesis
Exponents
Multiply
Divide
Add
Subtract

How many steps are there to the order of operations?

There are only 4 steps.

Multiply/Divide together <u>from left to right</u>.

Add/Subtract together <u>from left to right</u>.

1 2 3 4

PEMDAS

MATH PROBLEMS THAT BROKE THE INTERNET

Simplify.

1 2 3 4
PEMDAS

ex2) $8 \div 2(2+2)$

$8 \div 2(4)$ Remember to multiply and divide from left to right!

$4(4)$

$= 16$

ex3) $6 \div 2(1+2)$

$6 \div 2(3)$

$3(3)$

$= 9$

THE ORDER OF OPERATIONS

Simplify.

1 2 3 4
PEMDAS

ex4) $14 - 12 \cdot 3 + 2 \div 2$

$14 - 36 + 2 \div 2$

$14 - 36 + 1$

$-22 + 1$

$= -21$

Remember to add/subtract from left to right!

ex5) $7 + 18 \div 3^2$

$3 \cdot 3$

$7 + 18 \div 9$

$7 + 2$

$= 9$

THE ORDER OF OPERATIONS

Simplify.

1 2 3 4
PEMDAS

ex6) $6(2+5)-15$

$6(7)-15$

$42-15$

$= 27$

ex7) $(1+8)-(5+2^2)$

$(9)-(5+4)$

$9-9$

$= 0$

THE FIVE GROUPING SYMBOLS

Grouping symbols force multiple numbers to behave as a single number.

Parenthesis ( )

Brackets [ ]

Braces { }

Absolute Value | |

Big Division Bar $\frac{1+2}{6-3}$

When several grouping symbols are used together, always work from the inside out.

THE ORDER OF OPERATIONS

Simplify.

ex8) $3 + \left[36 \div (17 - 5)\right]$

$3 + \left[36 \div (12)\right]$

$3 + 3$

$= 6$

THE ORDER OF OPERATIONS

Simplify.

1 2 3 4
PEMDAS

ex9) $12 - \left[3\left(7 + 3^2\right) \div 4\right]$

$12 - [3(7+9) \div 4]$

$12 - [3(16) \div 4]$

$12 - [48 \div 4]$

$12 - 12$

$= 0$

THE ORDER OF OPERATIONS

Simplify.

1 2 3 4
PEMDAS

ex10) $\left\{40-\left[3\left(2+2^2\right)\right]\cdot 2\right\}+1$

$\{40-[3(2+4)]\cdot 2\}+1$

$\{40-[3(6)]\cdot 2\}+1$

$\{40-18\cdot 2\}+1$

$\{40-36\}+1$

$4+1=5$

THE ORDER OF OPERATIONS

Simplify.

1 2 3 4
PEMDAS

ex11) $\dfrac{|2-8|}{1+2} = \dfrac{|-6|}{3} = \dfrac{6}{3} = 2$