## NICKS \& TRICKS

## LUKE'S GUIDE TO JUNIOR CERT HL MATHS

## Topic 3 - Functions

Functions are all about inputs and outputs. Graphs are also an extremely important part of functions, with both reading and making graphs being involved in most functions exam questions. Learn the nicks \& tricks below to help you read, graph and solve any function!
(i) Real Life
[ii) Graphing Functions
(iii) Functions Equations
(iv) Function Theory

## (i) REAL LIFE

Think of any function just like cooking in an oven. You put something into the oven and something else comes out.


If Justin Bieber is cooking, he could put some cake batter into an oven and out comes a cake. Whereas if he put potatoes into the oven, out comes chips. The exact same thing with functions! You put something in ( $x$-value) and you get something out (y-value)

## (ii) GRAPHING FUNCTIONS

In order to graph a function, we need to be able to read graphs and co-ordinates.

In the diagram on the right, the $x$-axis is shown in blue and the $y$-axis is shown in red. The coordinates of $A$ are $(4,2)$. For coordinates, the first number is where the point is on the $x$-axis and the second number is where the point is on the $y$-axis.


To graph a function, pick $6 x$-values and make the following table:
(In this example we are going to graph the function $f(x)=x-2$ )

| $x$ | $f(x)=x-2$ | $y$ | $[x, y]$ |
| :---: | :---: | :---: | :---: |
| 1 | $[1]-2$ | -1 | $(1,-1]$ |
| 2 | $[2]-2$ | 0 | $[2,0)$ |
| 3 | $[3]-2$ | 1 | $[3,1]$ |
| 4 | $[4]-2$ | 2 | $[4,2]$ |
| 5 | $[5]-2$ | 3 | $[5,3]$ |
| 6 | $[6]-2$ | 4 | $[6,4]$ |



## (iii) FUNCTIONS EQUATIONS



Find f(3)

$$
f(3)=(3)-2
$$

$f(3)=1$


## (iv) FUNCTION THEORY

Function Definition = A function is only allowed to have $1 y$-value for every $x$-value!


On your exam you may be asked to check if a graph is a function. To do this, draw a straight vertical line anywhere on the graph. If you can draw a line anywhere that ends up hitting the function more than once, it's not a function!
$\longleftarrow$ Not a function!

## LUKE'S EXAM PREDICTIONS

> Graphing Functions has come up at least once every year for the past 5 years!
> Functions Equations have come up 3 out of the past 5 years!
> Domain/Range have come up 2 out of the past 5 years!
$>$ Function Definition has come up once out of the past 5 years!

If you study this guide, you will be ready for any functions questions they have to throw at you! Graphing functions is an especially nice topic that comes up often so be sure to have that nailed for some easy, free marks!
"The maths exam is about progress, not perfection!"

