

Zero Degree Polynomial (or Constant) Linear Function

Working Definition: Straight horizontal line on the Cartesian plane
 Dependent variable never changes

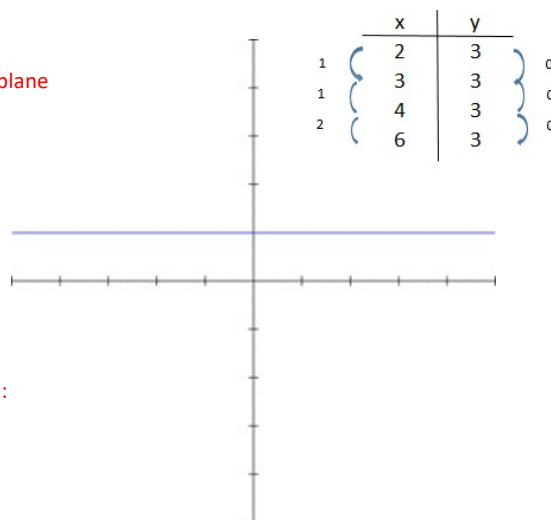
Real life example: Cost of bus pass and KM travelled

Rule example: $f(x) = 60$

$$y = \#$$

Graph:

How to recognize: y value stays the same no matter what



First Degree Direct/Partial (Linear) Function

Working Definition: Increases or decreases at a constant rate

Passes through the Y axis

	x	y
1	2	1
1	3	3
2	4	5
	6	9

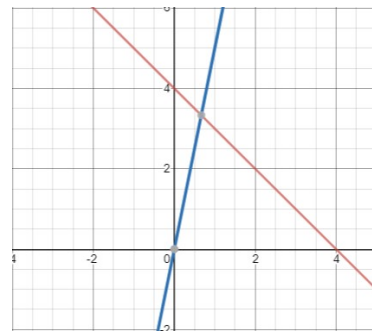
Real life example: By the hour salary / Emptying a pool over time

Rule example: $f(x) = 10.75x$ / $g(x) = 2500 - 60x$

$$y = ax + b$$

Graphs:

How to recognize: Increases/Decreases at a constant rate



2nd Degree Polynomial/Quadratic Function

Working Definition: Mirror image graph (because of the scare)
Forms a parabola across the vertex

Real life example: Height of a thrown ball over time

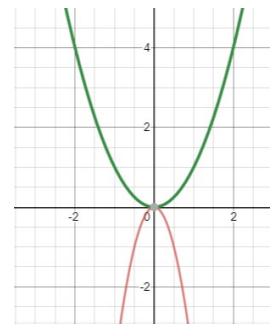
Rule example: $f(x) = 5x^2$ $g(x) = -2x^2$

$$y = ax^2$$

Graph:

How to recognize: Increases/decreases evenly on both sides

	x	y	
1	2	8	10
1	3	18	
2	4	32	14
	6	72	



Exponential Function

Working Definition: Independent variable is an exponent
Curves upward or down ward

Real life example: Bacterial growth/decay over time

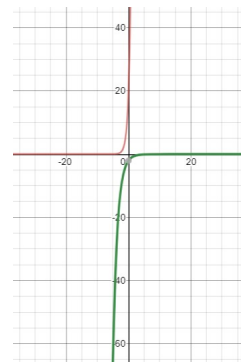
Rule example: $f(x) = 20(3)^x / g(x) = 2(\frac{1}{2})^x$

$$y = a(c)^x$$

Graph:

How to recognize: Increases/decreases very quickly

	x	y	
1	2	18	} 36
	3	54	
1	4	162	} 108
	6	1458	
2			} 1296



	<u>Linear</u>	<u>Quadratic</u>	<u>Exponential</u>
Rule	$y = ax + b$	$y = ax^2$	$y = a(c)^x$
Role of 'a'	slope up/down	width and direction	initial value - goes thru y axis
Domain	all real numbers	all real numbers	all real numbers
Range	all real numbers	+ R or - R	+ R or - R
Y intercept	(0, b)	(0, 0)	(0, a)
Zero(s)	$0 = ax + b$	(0, 0)	No zero
Extremes	+ R & - R	0, no max or no min, 0]0, no max or no min, 0[
Signs	p [0, +R[, n]-R, 0] p]-R, 0] , n [0, +R[pos [0, +r] & never neg never pos & neg]-R, 0]	pos]0, +r] & never neg never pos & neg]-R, 0[
Variation	i [0, +R[, d]-R, 0] i]-R, 0] , d [0, +R[inc [0, +r] & never dec never inc & dec]-R, 0]	inc]0, +r] & never dec never inc & dec]-R, 0[
Key words	"constant", "line"	"2nd degree", "parabola"	"triples", "compounded"
Responsibility	recognize, find the rule (a/b) extrapolate, graph	recognize, find the rule (a) extrapolate, graph	recognize, find the rule (a/c) extrapolate, graph