1st & 2nd DIFFERENCES: LINEAR vs. QUADRATIC

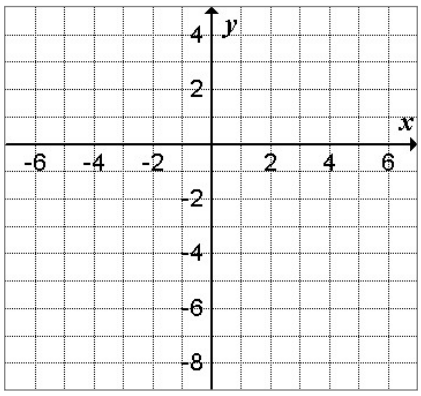
LINEAR RELATION: FIRST DIFFERENCES ARE CONSTANT (with evenly spaced x-values).

QUADRATIC RELATION: SECOND DIFFERENCES ARE CONSTANT (with evenly spaced x-values).

1. Consider the relation $y = 2x - 4$

a) Complete the table of values and calculate the First Differences for $y = 2x - 4$

x	y = 2x – 4	1st Diff	2nd Diff
-2	=2( ) – 4 =		
-1	=2( ) – 4 =		
0	=2( ) – 4 =		
1	=2( ) – 4 =		
2	=2( ) – 4 =		

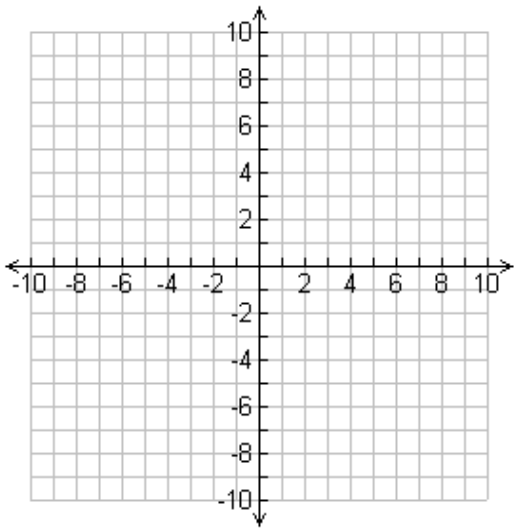


b) What do the 1st Differences tell you about the relation $y = 2x - 4$?

2. Consider the relation $y = 2x^2 - 4$

a) Calculate the First and Second Differences for $y = 2x^2 - 4$ (TOV done for you ☺)

x	y	1st Difference	2nd Difference
-3	14		
-2	4		
-1	-2		
0	-4		
1	-2		
2	4		



b) What do the 1st and 2nd differences tell you about the relation?

3. The relation $h = -5t^2 + 210$ describes the path of a rock that falls from the top of a cliff, with h representing the height in metres and t representing the time in seconds.

a) Complete the table.

t (s)	h (m)	(x , y)	1st Diff	2nd Diff
0	$=-5(\ \ )^2 + 210 =$			
1	$=-5(\ \ )^2 + 210 =$			
2	$=-5(\ \ )^2 + 210 =$			
3	$=-5(\ \ )^2 + 210 =$			
4	$=-5(\ \ )^2 + 210 =$			
5	$=-5(\ \ )^2 + 210 =$			
6	$=-5(\ \ )^2 + 210 =$			

b) What do the 1st and 2nd Differences tell you about the path of the rock?

How to tell the difference between a LINEAR RELATION and a QUADRATIC RELATION:

Given…	LINEAR	QUADRATIC
GRAPH		
TOV		
EQUATION		