

Quadratic Function

SUMMARY

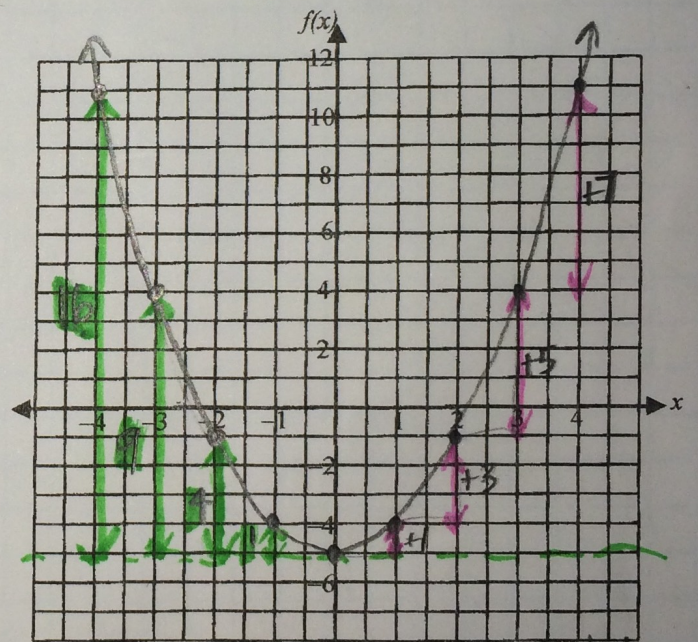
Rate of Change	Linear (constant 2 nd difference, 1 st diff are linear)
Graph	Parabola (symmetry)
Equations: Recursive	change from previous is adding a LINEAR expression (x term)
Explicit	highest power term is x^2 (degree of 2)

- The name quadratic comes from "quad", meaning square, because the variable is an x^2 . In visual patterns, look for quadrilateral areas (TWO DIMENSIONAL GROWTH).
- 2nd degree polynomial generated by the PRODUCT of two linear factors.

Example:

x	f(x)	1 st diff.	2 nd diff.
-4	11		
-3	4	-7	
-2	-1	-5	+2
-1	-4	-3	+2
0	-5	-1	+2
1	-4	+1	+2
2	-1	+3	+2
3	4	+5	+2
4	11	+7	+2

QUAD LINEAR CONSTANT



one output to next is LINEAR SEQ. (1st diff)

Recursive Equation:

① Find linear change: $d(x) = -7 + 2(x - 3)$
 $= -7 + 2(x + 3)$
 ② Simplify: $= -7 + 2x + 6 = 2x - 1$

$f(-4) = 11$; $f(x) = f(x-1) + 2x - 1$

Explicit Equation:

(simple cases) QUADRATIC

$f(x) = x^2 - 5$

$\frac{1}{2}$ OF 2nd difference $f(0)$