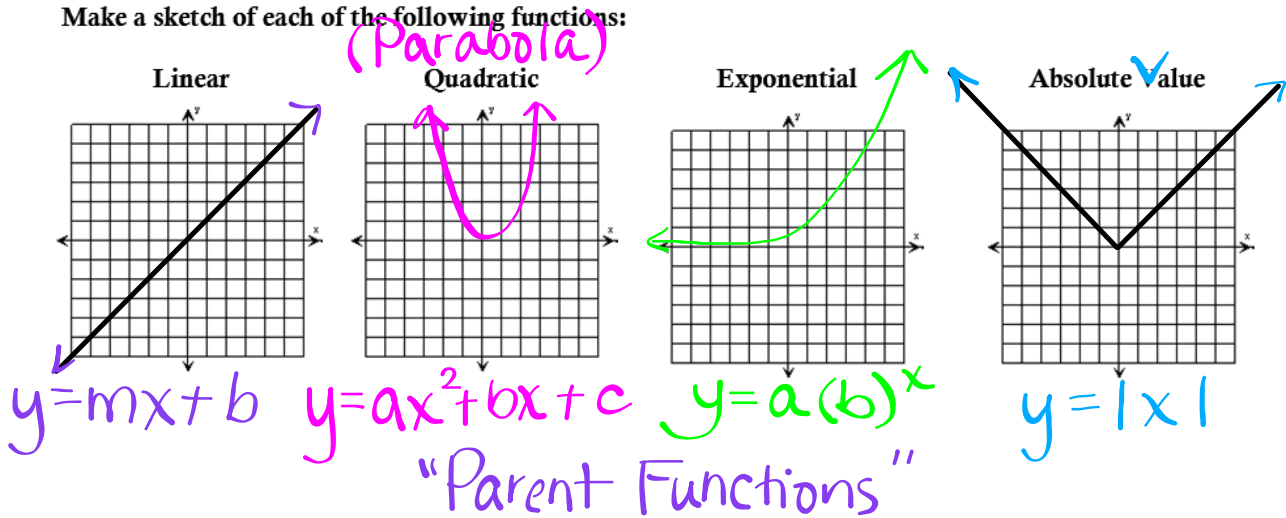


Opening Exercise...

Make a sketch of each of the following functions:



Label each function as linear, quadratic, exponential, or absolute value.

- a. $y = 9 - 5x$ Linear
- b. $y = 2x^2 + 3$ Quadratic
- c. $f(x) = -|3x|$ Absolute Value
- d. $g(x) = .25^x$ Exponential
- e. $h(x) = x^2 + 2x - 15$ Quadratic
- f. $f(x) = \frac{5}{3}x$ Linear
- g. $y = 4^x - 3$ Exponential
- h. $b(x) = .4x + 1.7$ Linear

How can you tell from a table what kind a function it is?

Based on the tables given, classify each function as linear, quadratic, or exponential:

1st Difference

x	y
-3	11
-2	9
-1	7
0	5
1	3
2	1
3	-1

$\begin{matrix} > -2 \\ > -2 \\ > -2 \\ > -2 \\ > -2 \\ > -2 \end{matrix}$

Linear

2nd Difference

x	y
-3	0
-2	5
-1	8
0	9
1	8
2	5
3	0

$\begin{matrix} > +5 > -2 \\ > +3 > -2 \\ > +1 > -2 \\ > -1 > -2 \\ > -3 > -2 \\ > -5 > -2 \end{matrix}$

Quadratic

x	y
0	1
1	2
2	4
3	8
4	16
5	32
6	64

$\begin{matrix} > \times 2 \\ > \times 2 \\ > \times 2 \\ > \times 2 \\ > \times 2 \\ > \times 2 \end{matrix}$

Exponential

- ❖ If the difference in y-values is CONSTANT, the function is **LINEAR**.
- ❖ If the first difference is NOT constant, but the SECOND difference is, the function is **QUADRATIC**.
- ❖ If the multiple is constant from each y-value to the next, the function is **EXPONENTIAL**.

Examples:

1 Which table of values represents a linear relationship?

x	f(x)
-1	-3
0	-2
1	1
2	6
3	13

(1)

x	f(x)
-1	-3
0	-1
1	1
2	3
3	5

(2)

x	f(x)
-1	$\frac{1}{2}$
0	1
1	2
2	4
3	8

(3)

x	f(x)
-1	-1
0	0
1	1
2	8
3	27

(4)

Quadratic

Linear

Exponential

2 The table below shows the average yearly balance in a savings account where interest is compounded annually. No money is deposited or withdrawn after the initial amount is deposited.

Year	Balance, in Dollars
0	380.00
10	562.49
20	832.63
30	1232.49
40	1824.39
50	2700.54

$\times 182.49$
 $\times 270.14$

Which type of function best models the given data?

- (1) linear function with a negative rate of change
- (2) linear function with a positive rate of change
- (3) exponential decay function
- (4) exponential growth function