

B4 Alg. 2 9/14/11

AA

Functions (con't)

Find each value if $g(x) = x^2 - x$ and $f(x) = 3x - 5$

1. $g(3)$
 $g(x) = x^2 - x$
 $g(3) = 3^2 - 3$
 $g(3) = 9 - 3$
 $g(3) = 6$

2. $f\left(\frac{2}{3}\right)$

$$f(x) = 3x - 5$$

$$f\left(\frac{2}{3}\right) = 3\left(\frac{2}{3}\right) - 5$$

$$f\left(\frac{2}{3}\right) = 2 - 5$$

$$f\left(\frac{2}{3}\right) = -3$$

3. $g(5n)$
 $g(x) = x^2 - x$
 $g(5n) = 5n^2 - 5n$
 $g(5n) = 25n^2 - 5n$

* can't combine diff.

~~like terms~~ powers

example: $n^2 + n$

~~cannot combine~~

~~cannot~~

~~cannot~~

Find each value if $h(x) = \frac{x^2 + 5x - 6}{x + 3}$

1. $h(-2) \rightarrow$ see back

$$h(-2) = \frac{x^2 + 5x - 6}{x + 3}$$

$$h(-2) = \frac{-2^2 + 5(-2) - 6}{-2 + 3} = \frac{(4 - 10) - 6}{1} = \frac{-6 - 6}{1}$$

$$h(-2) = \frac{-12}{1}$$

$$\boxed{h(-2) = -12}$$

$$2. h(x) = \frac{x^2 + 5x - 6}{x + 3}$$

$$h(a-1) = \frac{(a-1)^2 + 5(a-1) - 6}{a-1+3}$$

$$h(a-1) = \frac{a^2 - 2a + 1 + 5a - 5 - 6}{a+2}$$

$$h(a-1) = \frac{a^2 + 3a - 10}{a+2}$$

$$(2x)^2$$

$$4x^2$$

$$2x \cdot 2x$$

$$(a-1)^2$$

$$a^2 - 2a + 1$$

$$(a-1)(a-1)$$

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Recognize Patterns

Constant Functions - horizontal line

$$f(x) = c$$

$$y = c$$

$$y = 10$$

$$f(x) = 10$$

} example

IMPORTANT 2 REMEMBER

Linear Functions

$$Ax + By = c$$

$$f(x) = mx + b$$

Standard Form

Slope Intercept Form

$$6x + 7y = 27$$

$$f(x) = 24x + 5$$

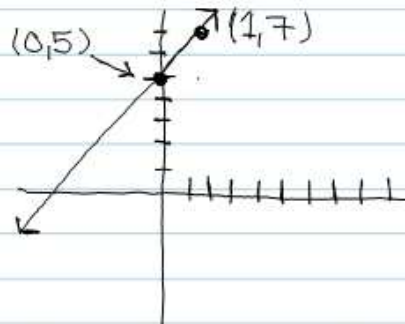
$$6x + 7y = 27$$

Graphing a Slope

Example:

$$f(x) = 2x + 5 \leftarrow (0, 5)$$

$$m = 2 = \frac{\Delta y}{\Delta x}$$



Intercept-Intercept

Example:

$$-2x + y = 5$$

x	y
0	5
2.5	0



Quadratic Functions

$$ax^2 + bx + c = 0$$

standard form

$$ax^2 + bx + c = 0$$

amount of humps

$$x^0 = 1$$

$$13,975^0 = 1$$

$$x^1 = x$$

$$13,975^1 = 13,975$$

Example:

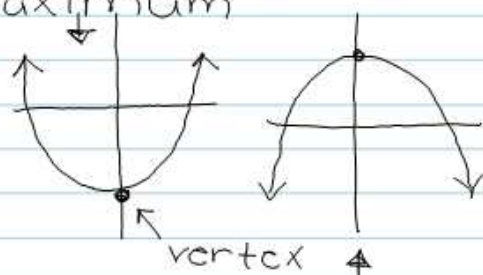
$$ax^2 + bx + c = 0$$

$$10x^2 + 5x + 2 = 0$$

(Con't)

$$f(x) = a(x-h)^2 + k$$

vertical form
maximum



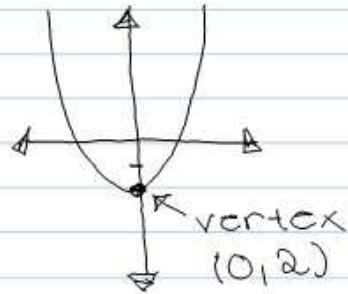
minimum

$$f(x) = a(x-h)^2 + k$$

'does the graph open up or down

'is the graph
~~so~~ narrow
or wide / less than $\frac{1}{2}$ = wide
greater than 1 = narrow

(con't)



$$f(x) = 1(x-0)^2 - 2$$

Parent
Function

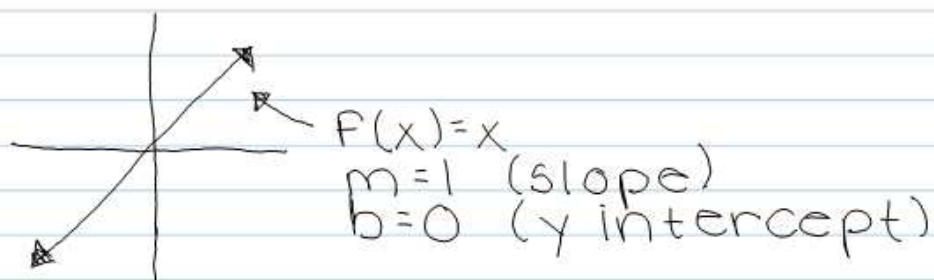
~~Parent function standard form~~

~~Parent function star~~

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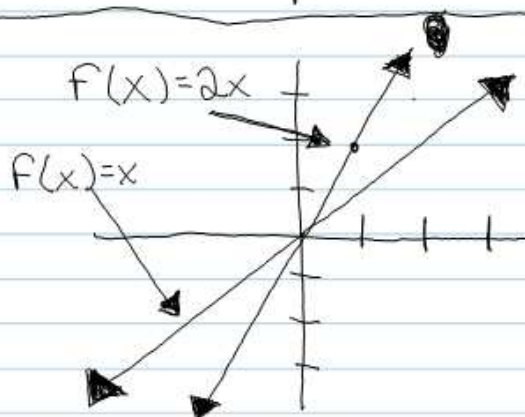
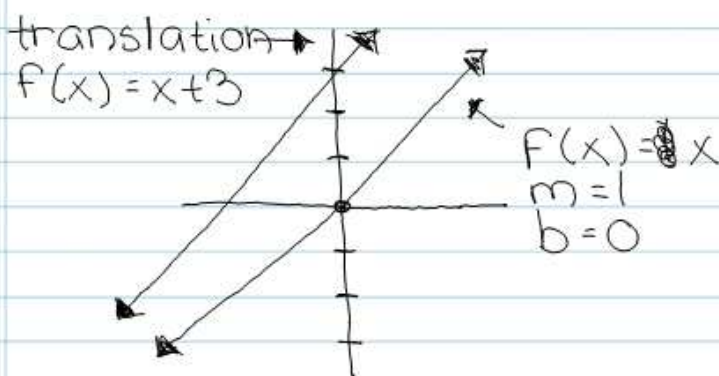
Functions

Linear Parent Function - $f(x) = x$



* parent function can also be written as $f(x) = 1x + 0$ (slope intercept form)

Example:



$$f(x) = x$$
$$y = 1x + 0$$

↑

$$mx + b$$

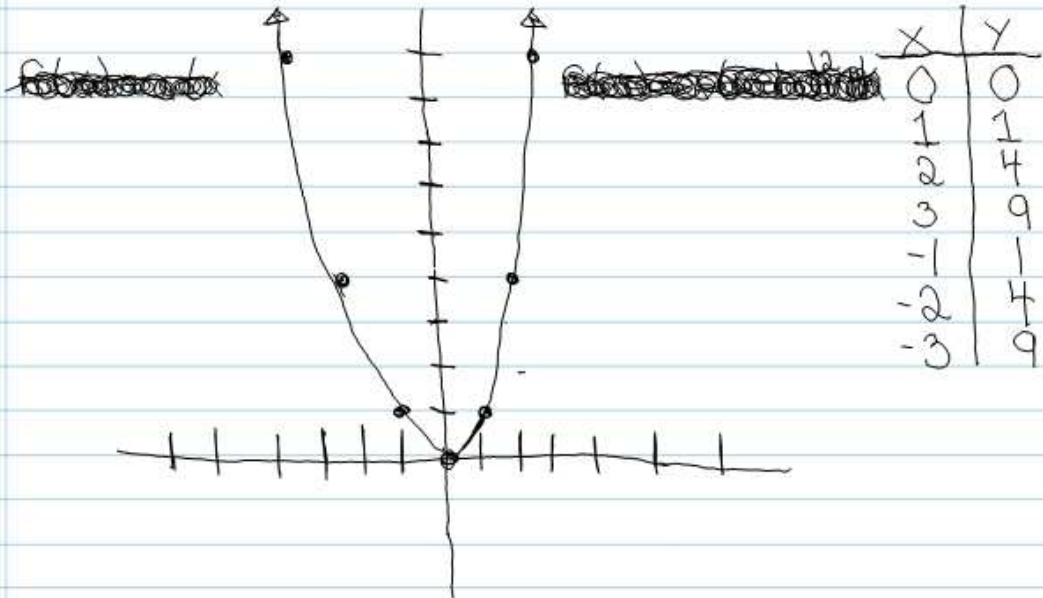
$$m > 1$$

$$y = 2x + 0$$

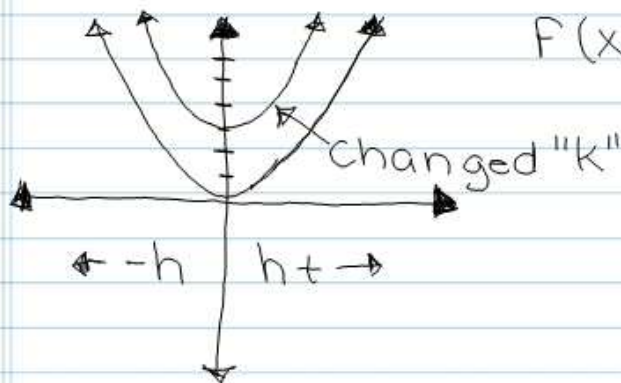
x	y
0	0
1	2
2	4

Quadratic Parent Function -

$$f(x) = x^2 \quad (f(x) = a(x-h)^2 + k)$$



Example:



$$f(x) = x^2 \quad \text{or} \quad f(x) = 1(x-0)^2 + 0$$

$$f(x) = 1(x-0)^2 + 3$$

$$x^2 + 3$$



$$f(x) = 1(x-3)^2 + 0$$

$$(x+3)$$

x	y
0	9
3	0
1	4
2	1

* 'a' controls 2 things:

1. vertical / Horizontal stretch

2. $|a|$ neg.  direction
a pos.  direction

$$f(x) = a(x-h)^2 + k$$

↑ horizontal
transform ↑

vertical