Who would like a textbook?

You may not want to print the "Vortex Activity".

p. 23 10 5f b

5. For each function, determine $f(-x)$ and $-f(-x)$ and compare it with $f(x)$. Use this to decide whether each function is even, odd, or neither.

a) $f(x) = x^2 - 4$

b) $f(x) = \sin x + x$

c) $f(x) = \frac{1}{x} - x$

d) $f(x) = 2x^3 + x$

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

f) $f(x) = |2x + 3|$

Please remind me to redo these on Monday when I can use a SmartBoard.

b) f(x)= sinx + x

f(-x)= sin(-x) + (-x)

= - sin(x) - x

= - [sin(x) + x]

= - f(x)

f(-x) = - f(x)

f(x) is Odd

f) f(x)= / 2x + 3 /

f(-x)= / 2(-x) + 3 /

= / -2x + 3 /

= / - (2x - 3) /

f(-x) ≠ - f(x)

f(x) is NOT Odd

10. T

a) $f(x)$ is a quadratic function. The graph of $f(x)$ decreases on the interval $(-\infty, +2]$ and increases on the interval $(2, \infty)$. It has a y-intercept at $(0, 4)$. What is a possible equation for $f(x)$?

b) Is there only one quadratic function, $f(x)$, that has the characteristics given in part a)?

c) If $f(x)$ is an absolute value function that has the characteristics given in part a), is there only one such function? Explain.

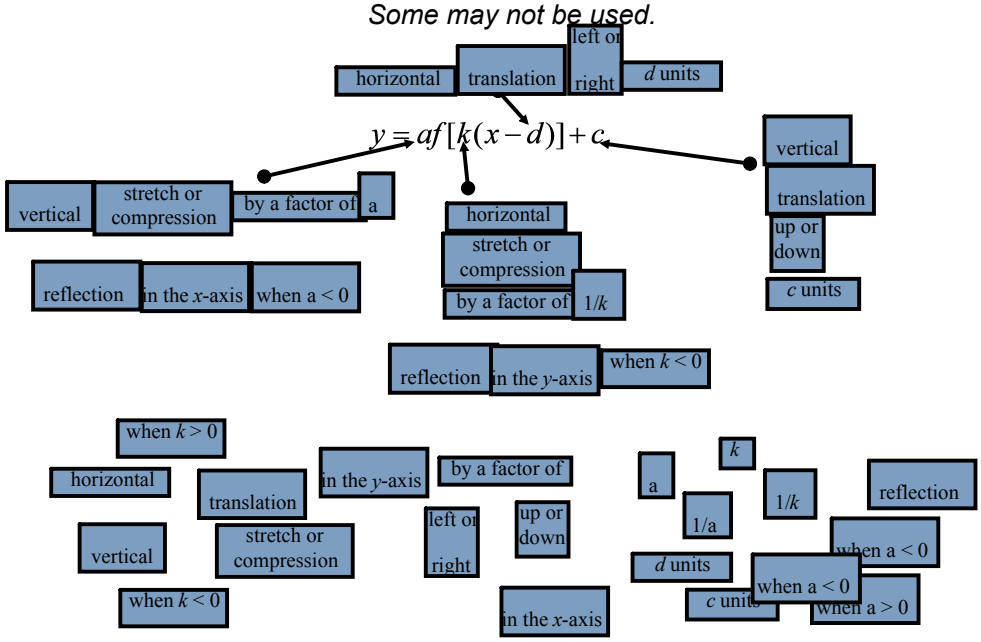
1.4 Graphing Functions

Math Learning Target:

"When I am given the equation of a transformed parent function, I can describe all transformations in order, determine a mapping formula, and graph the function.
When transformations are described, I can find its equation and graph.
I can state all properties about a transformed parent function."

The function $y = f(x)$ can be transformed into $y = af[k(x-d)]+c$

Use as many terms and values below to describe all of the possible transformations.
Some may not be used.

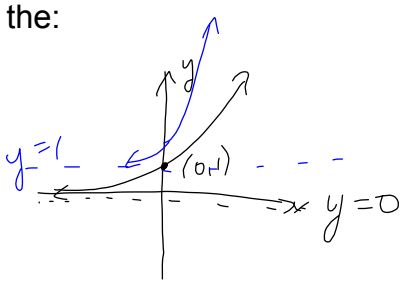


Ex. 1 State the function that would result from horizontally compressing $y = f(x)$ by a factor of 1/4, and then translating it 3 units left.

$k = 4$
$d = -3$

$y = f(4(x-(-3)))$
$= f(4(x+3))$

Ex. 2 For the function $y = 2 \cdot 3^x + 1$, state the:
a) parent function
b) domain and range
c) intervals of increase/decrease
d) end behaviours



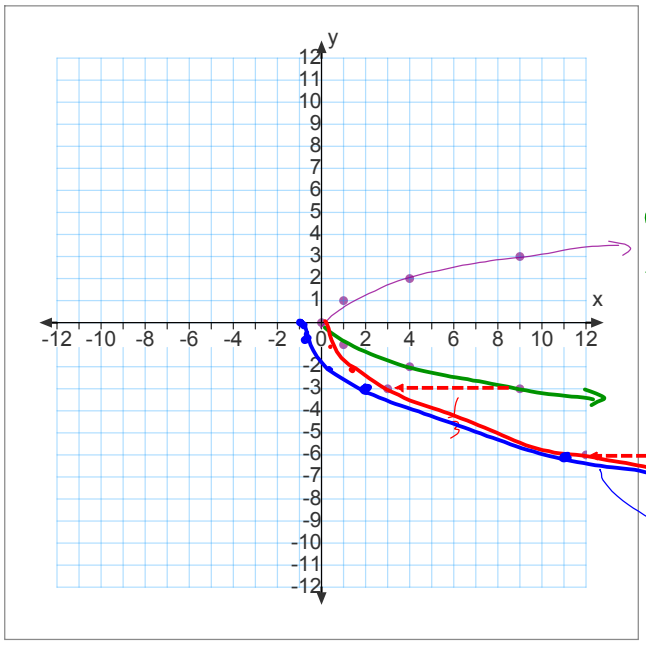
a) $y = 3^x$

b) D: $x \in (-\infty, \infty)$
R: $y \in (1, \infty)$

c) Increase: $(-\infty, \infty)$
decrease: none

d) as $x \to \infty, y \to \infty$
$x \to -\infty, y \to 1$

Ex. 3 Describe, in order of application, thetransformations of $f(x)=\sqrt{x}$ defined by $y=-f[3x+3]$.
Graph the transformed function, and state the equation.



$y=-f[3(x+1)]$

$\therefore y=-\sqrt{3(x+1)}$

$a=-1$ reflection in the x-axis

$k=3$ h.c by a factor of $\frac{1}{3}$

$d=-1$ ht. 1 unit left

$\frac{1}{3}$

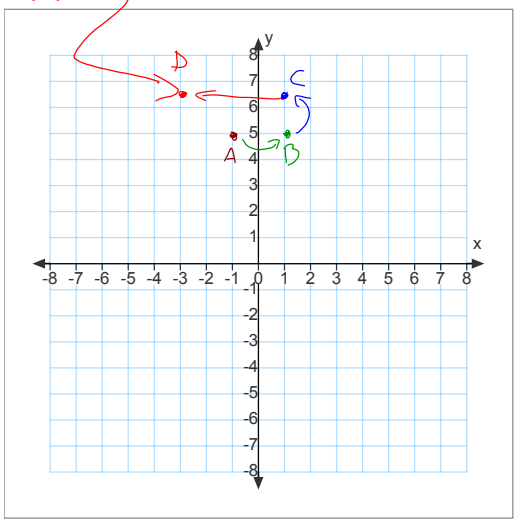
$y=-\sqrt{3(x+1)}$

Ex. 4 The point (-1, 5) belongs to the function $y=f(x)$.
Determine its corresponding coordinates for the function $y=f(-x-4)+\frac{3}{2}$.

$=f(-(x+4))+\frac{3}{2}$

D(-3, $6\frac{1}{2}$)

Graphically



Numerically

x	y
$-1(-1)-4$	$(5)+\frac{3}{2}$
$=-3$	$=6\frac{1}{2}$

Hence $(-1,5)\to(-3,6\frac{1}{2})$

Algebraically
(mapping formula)

$(x,y)\to(-x-4, y+\frac{3}{2})$

$(-1,5)\to(-(-1)-4, (5)+\frac{3}{2})$

$\to(1-4, 5+1\frac{1}{2})$

$\to(-3, 6\frac{1}{2})$

In general,

if $y=af(k(x-d)+c)$

$(x,y)\to(\frac{1}{k}x+d, ay+c)$

Do all questions on the worksheet