

Friday 10/19 Precalc

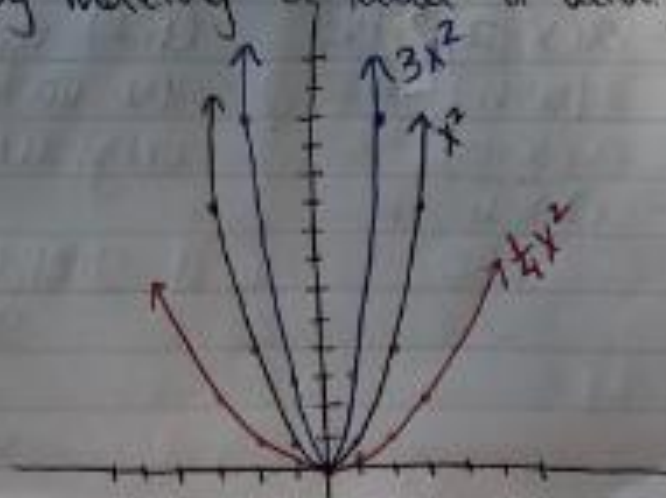
objective: sketch nonrigid transformations and write the equation from the graph

Non Rigid Transformations

vertical or horizontal stretch or shrink of a line

- sketch each (by making a table of value) on the same axes

- A. $f(x) = x^2$
- B. $f(x) = 3x^2$
- C. $f(x) = \frac{1}{4}x^2$



-2	1
-1	$\frac{1}{4}$
0	0
1	$\frac{1}{4}$
2	1
3	$\frac{9}{4} = 2\frac{1}{4}$

-2	12
-1	3
0	0
1	3
2	12

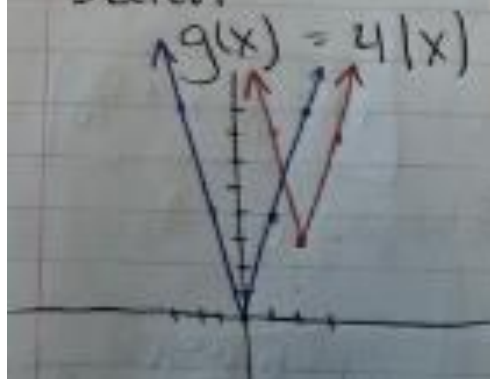
so if the coefficient is $\# > 1$ there is vertical stretch / horizontal shrink
 $0 < \# < 1$ there is vertical shrink / horizontal stretch
 (and if negative then a reflection happens)

Sketch

$g(x) = 4|x|$

then use it to sketch

$h(x) = 4|x-2| + 3$
right 2 up 3



classwork: sketch each

① $g(x) = 2(x-4)^2 + 3$

② $h(x) = \frac{1}{2}(x+2)^3 - 1$

③ $j(x) = -3|x-1| + 5$

④ $k(x) = \sqrt{\frac{1}{3}x} - 4$

Write the equations from the graph (when $a \neq 1$)
Standard forms

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

$$f(x) = a|x-h| + k$$

$$f(x) = a(x-h)^3 + k$$

$$f(x) = a\sqrt{x-h} + k$$

...etc

(h, k) represents the location of the vertex (the point that was originally $(0, 0)$ on the parent)

a = stretch/compress
scale factor / reflection
over x-axis



$$f(x) = a(x-h)^2 + k$$
$$-10 = a(-2+3)^2 - 4$$
$$-10 = a(-1)^2 - 4$$
$$-6 = 1a$$
$$a = \frac{-6}{1} = -6$$

$$f(x) = -6(x+3)^2 - 4$$



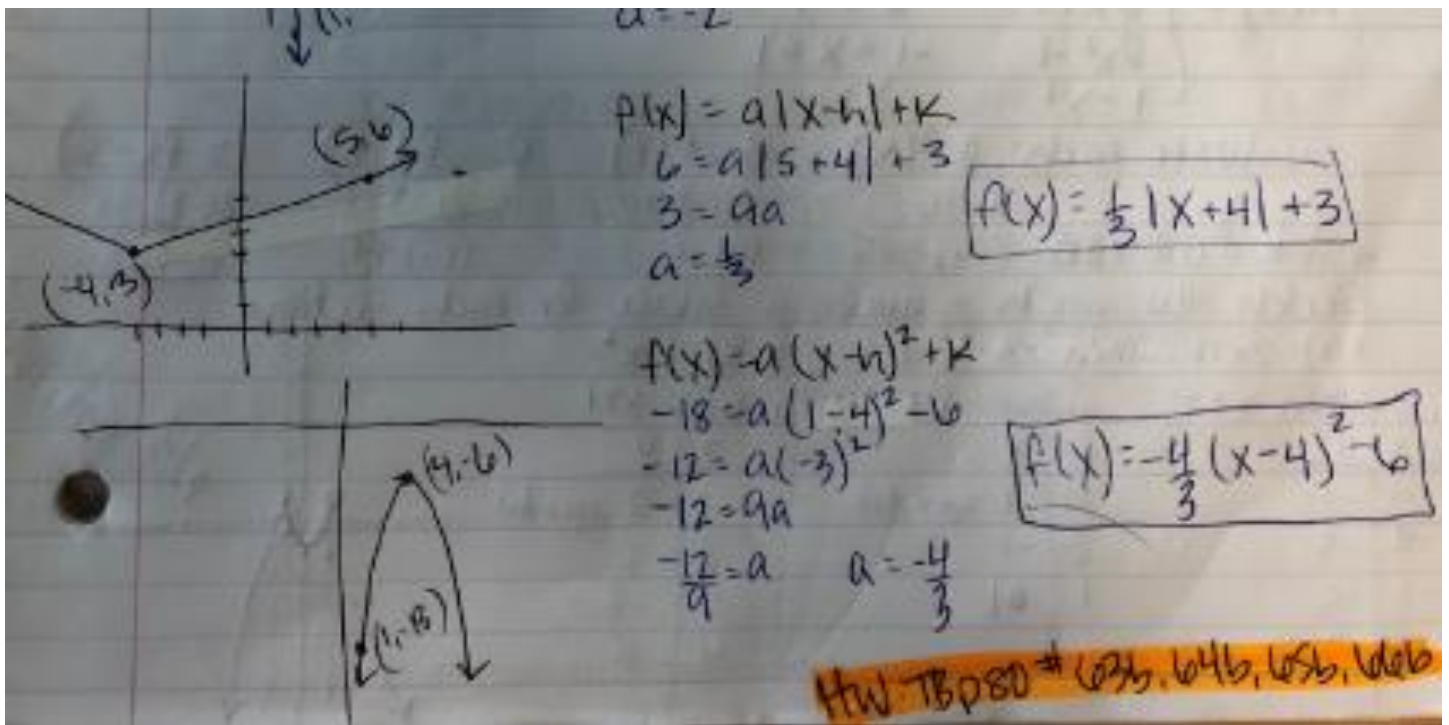
$$f(x) = a\sqrt{x-h} + k$$
$$14 = a\sqrt{11-2} + 5$$
$$14 = a\sqrt{9} + 5$$
$$9 = 3a$$
$$a = 3$$

$$f(x) = 3\sqrt{x-2} + 5$$



$$f(x) = a(x-h)^3 + k$$
$$-21 = a(1+1)^3 - 5$$
$$-16 = a(2)^3 - 5$$
$$-16 = 8a - 5$$
$$-11 = 8a$$
$$a = -\frac{11}{8}$$

$$f(x) = -\frac{11}{8}(x+1)^3 - 5$$



To make up the class points please do the following:

#1-4 Graphing in the classwork

1. $f(x) = 2(x-4)^2 + 3$

2. $f(x) = \frac{1}{2}(x+2)^3 - 1$

3. $f(x) = -3|x-1| + 5$

4. $f(x) = \sqrt{\frac{1}{3}x} - 4$

Textbook page 80 #63b, 64b, 65b, 66b