Bell Ringer

Tuesday 10/15

(time, height)

The function $h(t) = -16t^2 + 64$ represents the height (in feet) of a dropped object t seconds after being dropped.

a. Find the starting height of the object.

$h(0) = -16(0)^2 + 64$

$= 64$ ft

b. How many seconds will it take for the object to hit the ground?

$-16t^2 + 64 = 0$

$-16(t^2 - 4) = 0$

$-16(t+2)(t-2) = 0$

$-16 = 0$ ✗

$t + 2 = 0$ $t = -2$

$t - 2 = 0$ $t = 2$

$t = 2$ seconds

c. Suppose the initial height is adjusted by k feet.

How will this affect the function $h(t)$?

$+k$ higher start pt $-k$ lower start pt

d. Explain why only positive values of t are used.

positive time ONLY!!!

Week #8 Packet due!

All Ch 2 hw due **Tues 10/22**

Standards 2A and 2B Retakes due **Wed 10/23**

Review...

Standard Form:

$f(x)=ax^2+bx+c$

Vertex:

$\left(-\frac{b}{2a}, f\left(-\frac{b}{2a}\right)\right)$

Axis of symmetry:

$x=-\frac{b}{2a}$

Vertex Form:

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

Vertex:

(h,k)

Axis of symmetry:

$x=h$

3.4 Day 2 Translations Using Function Notation Notes **Name:**_____

	Inside	Outside
Constant	Moves L/R opposite direction	Moves up/down
Negative	Reflects across the y-axis	Reflects across the x-axis
If A>1 then Vertical Stretch, If 0<A<1 then Vertical Shrink		

Let's review. Given $f(x) = a(x-h)^2 + k$, answer the following questions.

1. How does h affect the parent graph of $f(x) = x^2$?

L or R (opposite of sign) + −

2. How does k affect the parent graph of $f(x) = x^2$?

Up or Down

3. How does a affect the parent graph of $f(x) = x^2$?

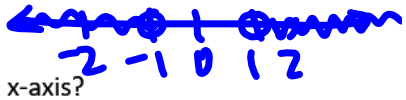
stretch / compress (shrink) / reflect over x-axis

   a. For what values of a is $f(x)$ wider than the parent graph?

$-1 < a < 1$

   b. For what values of a is $f(x)$ more narrow than the parent graph?

$a > 1$
$a < -1$



4. What must be in the equation in order to reflect the graph over the x-axis?

negative "a"

Using function notation we can describe transformations of functions in general in the following manner:

5. A vertical shift of $f(x)$ by k units can be represented by $f(x) + k$

   a. A vertical shift of $f(x)$ by 3 units up can be represented by: $f(x) + 3$

   b. A vertical shift of $f(x)$ by 4 units down can be represented by: $f(x) - 4$

6. A horizontal shift of $f(x)$ by h units can be represented by $f(x-h)$

   a. A horizontal shift of $f(x)$ by 2 units to the right can be represented by: $f(x-2)$

   b. A horizontal shift of $f(x)$ by 5 units to the left can be represented by: $f(x+5)$

7. A vertical stretch/shrinking of $f(x)$ by a factor of a can be represented by $af(x)$.

compress

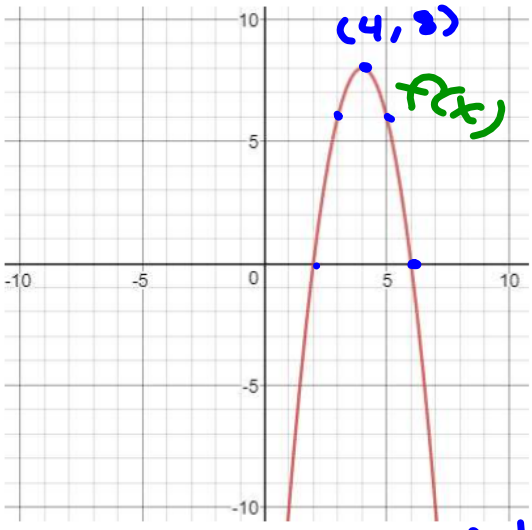
   a. A vertical stretch of $f(x)$ by a factor of 3 can be represented by: $3f(x)$

   b. A vertical shrink of $f(x)$ by a factor of $\frac{1}{4}$ can be represented by: $\frac{1}{4}f(x)$

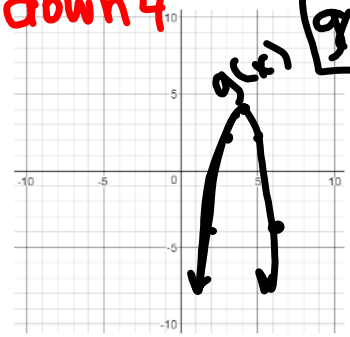
8. Reflections of $f(x)$ can be represented using a negative sign.
   a. A reflection of $f(x)$ over the x-axis can be represented by: $-f(x)$
   b. A reflection of $f(x)$ over the y-axis can be represented by: $f(-x)$

The function $f(x)$ and its graph are shown below. Describe the given transformation in words, then write a new equation in terms of x and graph the new function on the graph provided.

$f(x) = -2(x-4)^2 + 8$



1. $g(x) = f(x) - 4$ down 4

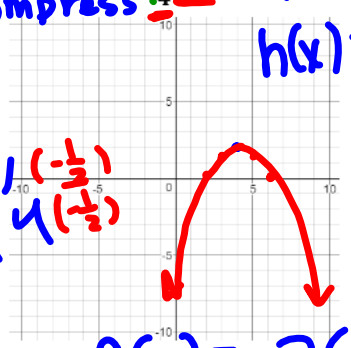


$g(x) = -2(x-4)^2 + 8 - 4$

$g(x) = -2(x-4)^2 + 4$

V: (4, 4)

2. $h(x) = \frac{1}{4}f(x)$ compress $\frac{1}{4}$



$h(x) = \frac{1}{4}(-2(x-4)^2 + 8)$

$h(x) = -\frac{1}{2}(x-4)^2 + 2$

V (4, 2)

out 1 up! $(-\frac{1}{2})$

out 2 up 4$(-\frac{1}{2})$

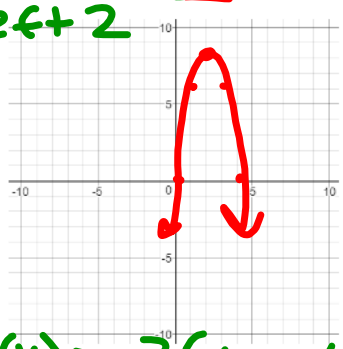
$f(x) = -2(x-4)^2 + 8$

$j(x) = 2(-2(x-1-4)^2 + 8)$

$j(x) = -4(x-5)^2 + 16$

(5, 16)

3. $k(x) = f(x+2)$ left 2

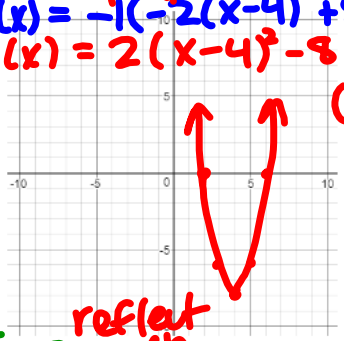


$k(x) = -2(x+2-4)^2 + 8$

$k(x) = -2(x-2)^2 + 8$

V (2, 8)

4. $m(x) = -f(x)$



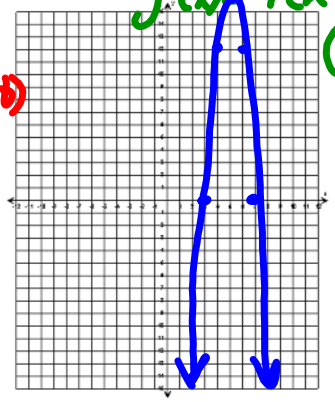
$m(x) = -1(-2(x-4)^2 + 8)$

$m(x) = 2(x-4)^2 - 8$

(4, -8)

reflect over x-axis

5. $j(x) = 2f(x-1)$



3.4 Day 2 hw pg 150-151 #s 3, 45-55, 70, 71, 73, 75