Today's Learning Goal(s):

By the end of the class, I will be able to:

a) Identify the "order of the moves" when graphing using transformations.
b) State the domain and range for "multiple move" transformations.

MCF 3MI

3.1.5 Graphing Quadratic Functions Using Transformations

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

vertex (h , k)

Date: _____
(**Every** lesson)

Correct yesterday's worksheet:

a -- p. 39 E,F ***h -- p. 39 C,D*** ***k -- p. 38 A,B***

You will be completing an EXIT card 10 minutes before class finishes.

Ex. 1 i) Use transformations to sketch each graph.
ii) State the Domain and Range.

$(x-(-2))^2+1$

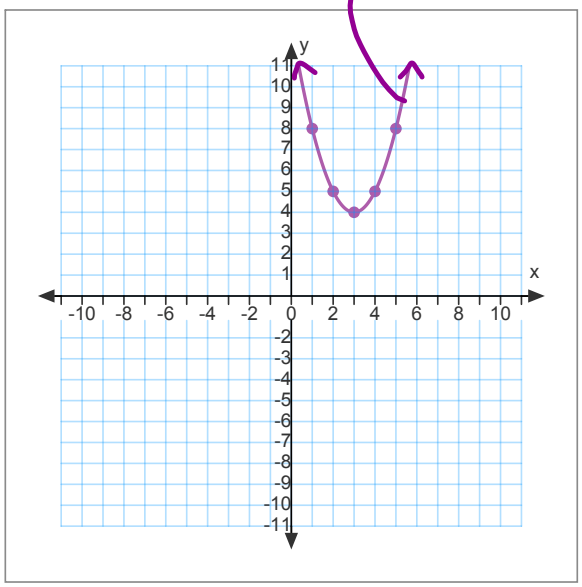
a) $f(x)=1(x-3)^2+4$ $a=1$

MG

over	up
1	1
2	4
3	9

vertex (3 , 4)

$y=(x-3)^2+4$



Domain $\{x \in \mathbb{R}\}$

Range $\{y \in \mathbb{R} \mid y \geq 4\}$

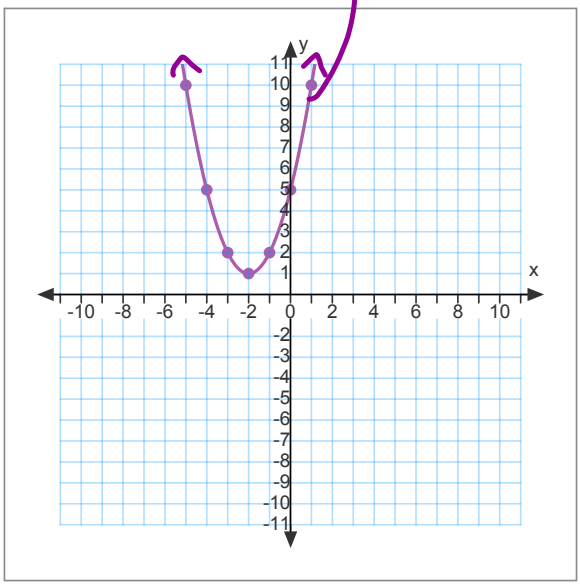
b) $g(x)=(x+2)^2+1$

MG

over	up
1	1
2	4
3	9

vertex (-2 , 1)

$y=(x+2)^2+1$



Domain $\{x \in \mathbb{R}\}$

Range $\{y \in \mathbb{R} \mid y \geq 1\}$

Ex. 1 (cont'd)

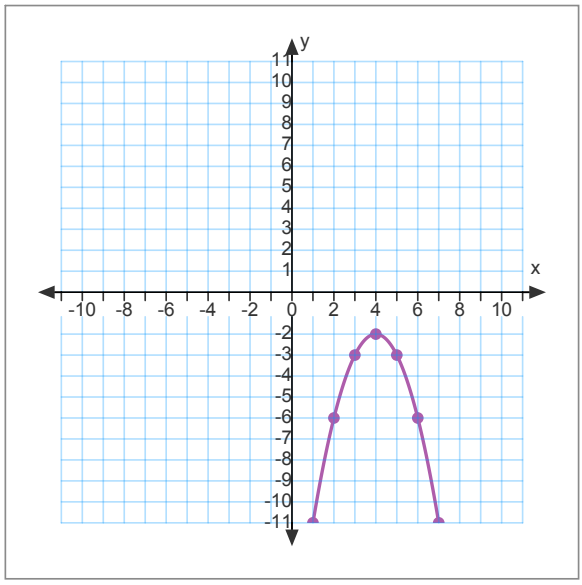
i) Use transformations to sketch each graph.
ii) State the Domain and Range.

c) $h(x) = -(x-4)^2 - 2$

MG over 1, down 1; over 2, down 4; over 3, down 9

vertex (4 , -2)

$y = -(x-4)^2 - 2$



Domain $\{x \in \mathbb{R}\}$

Range $\{y \in \mathbb{R} \mid y \leq -2\}$

Check $x = 5$

$h(x) = -(x-4)^2 - 2$

$h(5) = -(5-4)^2 - 2$

$= -(1)^2 - 2$

$= -(1) - 2$

$= -1 - 2$

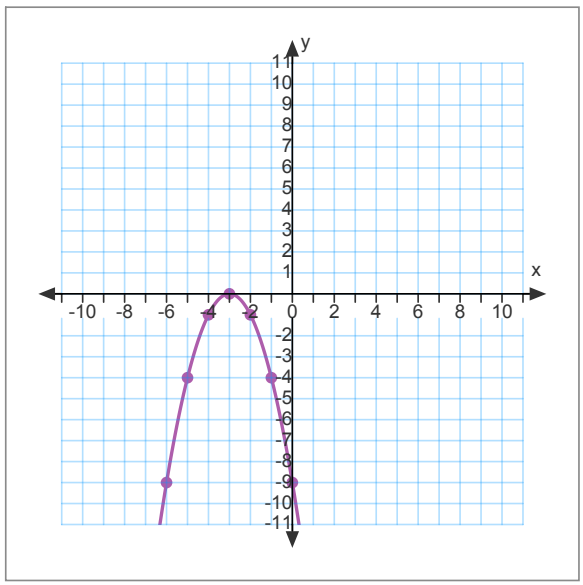
$= -3$

d) $i(x) = -(x+3)^2 + 0$

MG

vertex (-3 , 0)

$y = -(x+3)^2$



Domain $\{x \in \mathbb{R}\}$

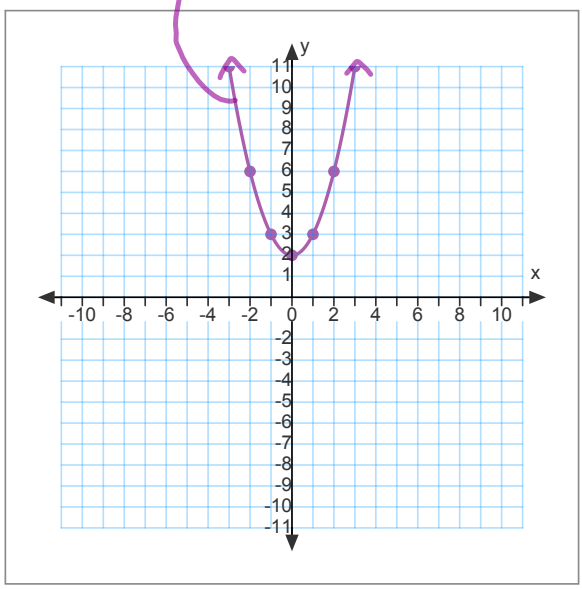
Range $\{y \in \mathbb{R} \mid y \leq 0\}$

Ex. 1 (cont'd)

i) Use transformations to sketch each graph.
ii) State the Domain and Range.

e) $j(x) = x^2 + 2$

MG ✓ vertex (0 , 2)

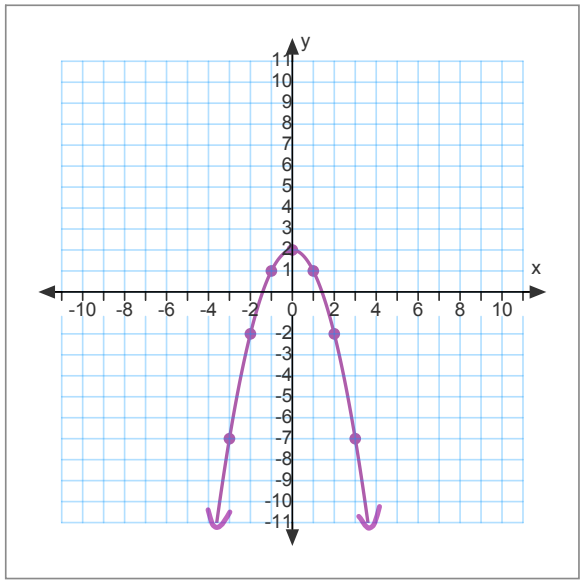


Domain $\{x \in \mathbb{R}\}$

Range $\{y \in \mathbb{R} \mid y \geq 2\}$

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

MG ✓ (down) vertex (0 , 2)



Domain $\{x \in \mathbb{R}\}$

Range $\{y \in \mathbb{R} \mid y \leq 2\}$

Homework today is modified as follows:

READ p.46 "In Summary" **CAREFULLY**, and ask me if anything is unclear!

i) Complete the exit card and submit it with your name to the teacher **BEFORE the end of class!**

ii) Sketch the 2 functions on the bottom of the handout. (on next screen, and tomorrow's file.)

ii) Complete: p. 40 # 1
pp. 47-49 # 1, 2, 9

EXIT CARD: **Put your name on it!**

Individually, answer the following questions on a piece of paper.
These must be answered and **handed in before you leave class**!

All questions deal with the quadratic equation: $y = a(x - h)^2 + k$

1) What is the effect of changing the parameters h and k.
(ie. what does h and k "do" to $y = x^2$)

2) If a is equal to -0.5, how will the graph of $y = x^2$ be affected?

3) Describe how $y = x^2$ is transformed into $y = 2(x - 4)^2 + 1$.
(ie. what transformations were applied)

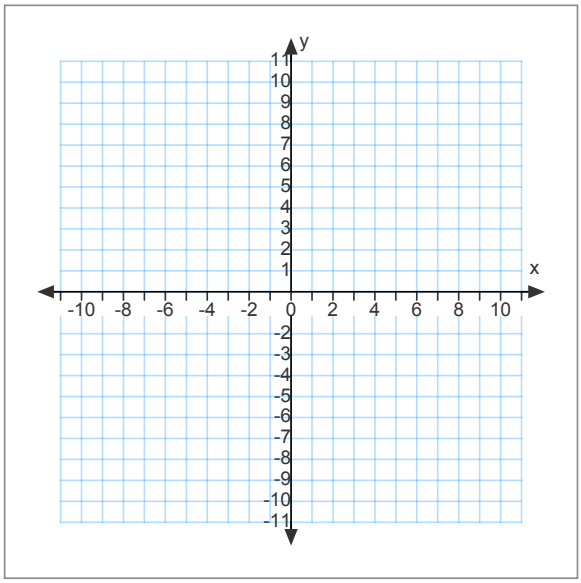
4) What is the domain & range of the function $y = 2x^2 + 13$?
(*hint: you may want to sketch it first)*

Additional homework questions from the bottom of the handout:

1. $a(x) = -(x+5)^2 - 3$

MG vertex (,)

$y = -(x+5)^2 - 3$



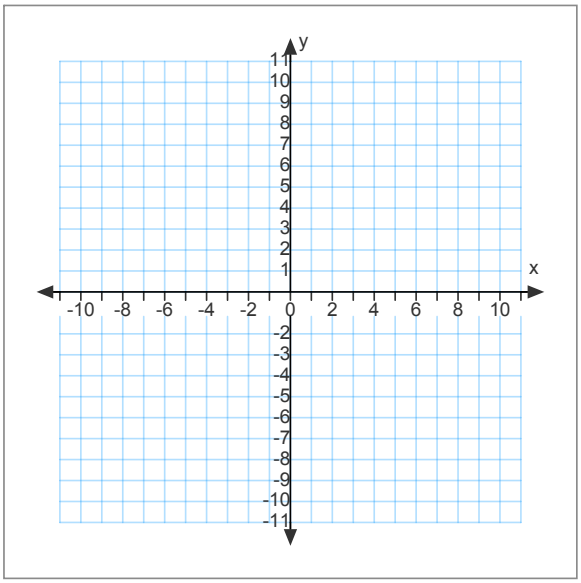
Domain _____

Range _____

2. $b(x) = 2(x-1)^2 - 7$

MG vertex (,)

$y = 2(x-1)^2 - 7$



Domain _____

Range _____