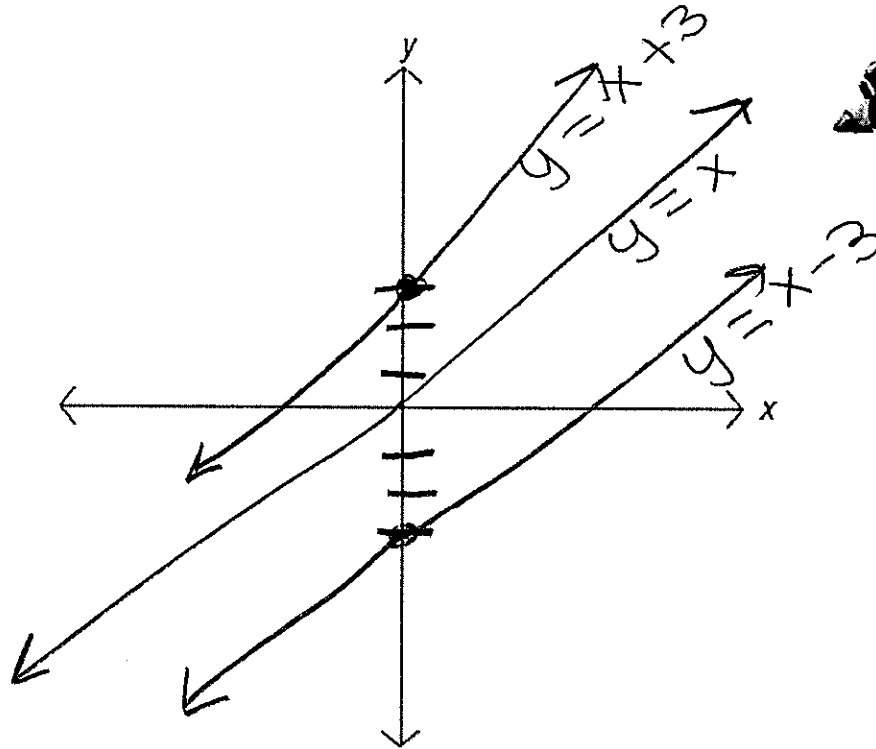
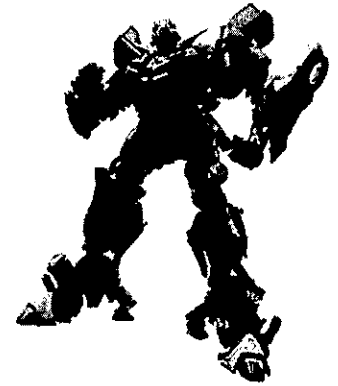


Do Now:

- Reset your calculator (2nd plus sign, #7, enter, #2)
- Go to $y =$ and type in x
- What kind of function do you see? linear
- Sketch the parent function $y = x$ below.



- a. What kind of transformation do you think $y = x + 3$ will have compared to the parent function?

vertical shift up 3 units

- b. What kind of transformation do you think $y = x - 3$ will have compared to the parent function?

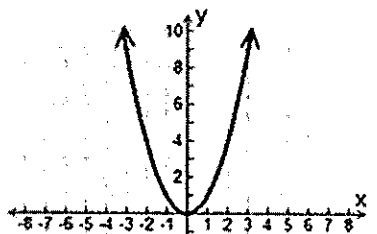
vertical shift down 3 units

- c. Write your own example of a linear equation that has a vertical shift.

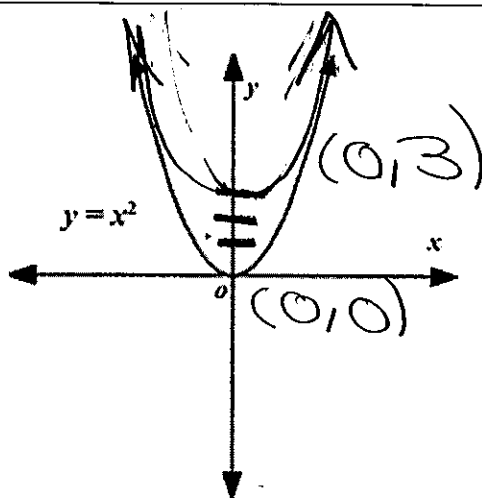
$$y = x \pm \text{any } \#$$

What is a transformation? is a change in movement or change in size.

AIM: TRANSFORMATIONS (DAY 1)

What type of function? <u>Quadratic</u>	
What is the parent equation? <u>$y = x^2$</u>	
Where is the vertex? <u>(0, 0)</u>	

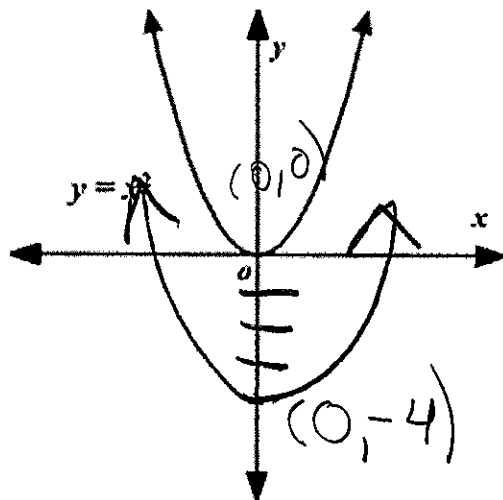
1. Sketch $h(x) = x^2 + 3$.



vertical shift
up 3 units

Describe how the graph of $h(x) = x^2 + 3$ is related to the graph of $f(x) = x^2$:

2. Sketch $g(x) = x^2 - 4$.



vertical shift

Describe how the graph of $g(x) = x^2 - 4$ is related to the graph of $f(x) = x^2$:

The graph of $f(x) = x^2 \pm k$ is the graph of $f(x) = x^2$

translates vertically

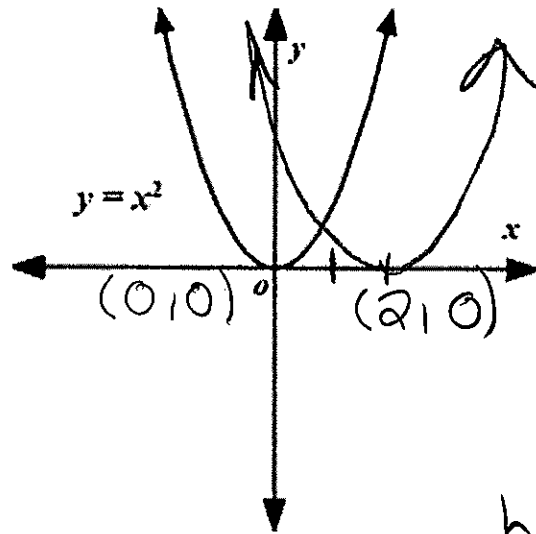
- When $k > 0$ (**positive #'s**), the graph translated

vertically up k units

- When $k < 0$ (**negative #'s**), the graph translated

vertically down k units

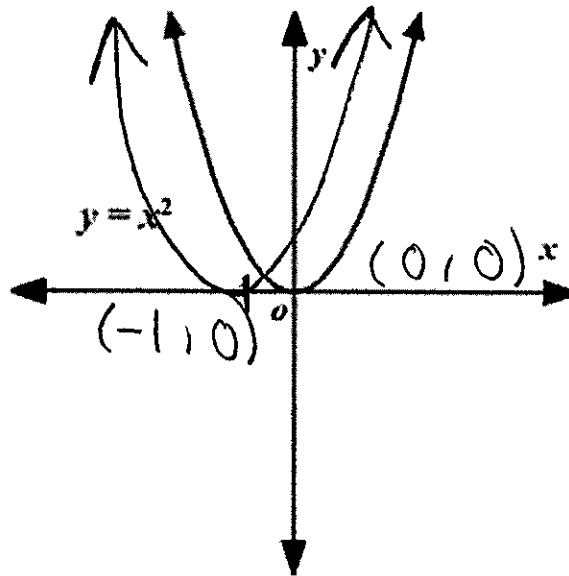
3. Sketch $k(x)=(x-2)^2$.



horizontal shift
right 2 units

Describe how the graph of $k(x)=(x-2)^2$ is related to the graph of $f(x)=x^2$:

4. Sketch $j(x)=(x+1)^2$.



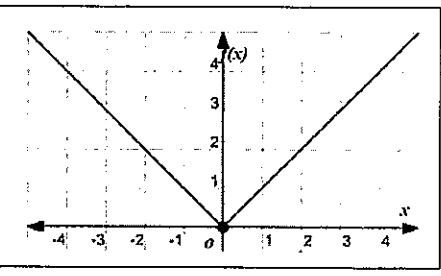
horizontal shift
left one unit

Describe how the graph of $j(x)=(x+1)^2$ is related to the graph of $f(x)=x^2$:

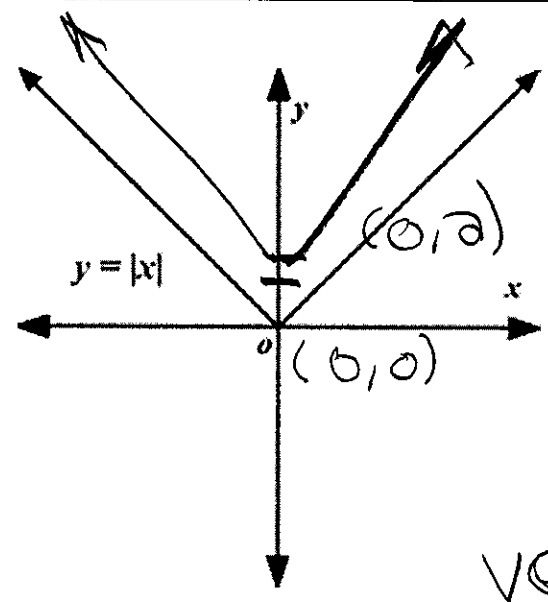
The graph of $f(x) = (x \pm h)^2$ is the graph of $f(x) = x^2$ horizontal translation

- When $h > 0$ (**positive #'s**), the graph is translated **horizontal shift left**
 h units
- When $h < 0$ (**negative #'s**), the graph is translated **horizontal shift**
right h units

What type of function? absolute value
 What is the parent equation? $y = |x|$
 Where is the vertex? $(0, 0)$



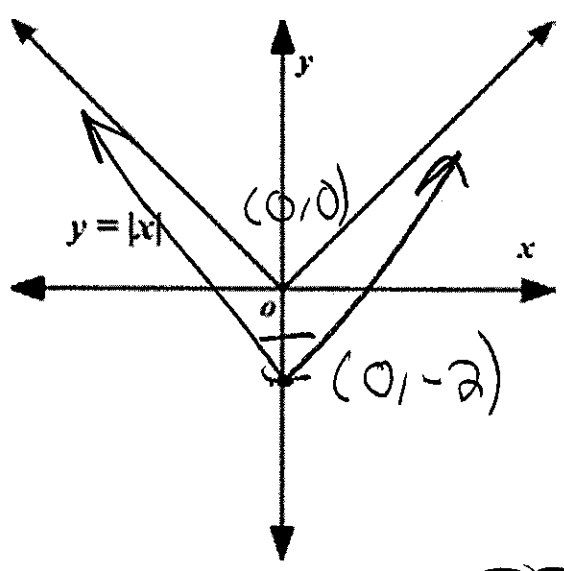
5. Sketch $y = |x| + 2$.



vertical shift
up 2 units

Describe how the graph of $y = |x| + 2$ is related to the graph of $y = |x|$:

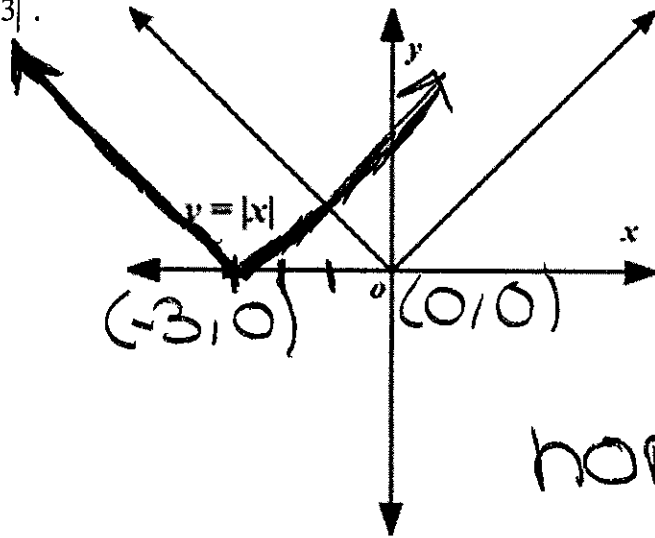
6. Sketch $y = |x| - 2$.



vertical shift
down 2 units.

Describe how the graph of $y = |x| - 2$ is related to the graph of $y = |x|$:

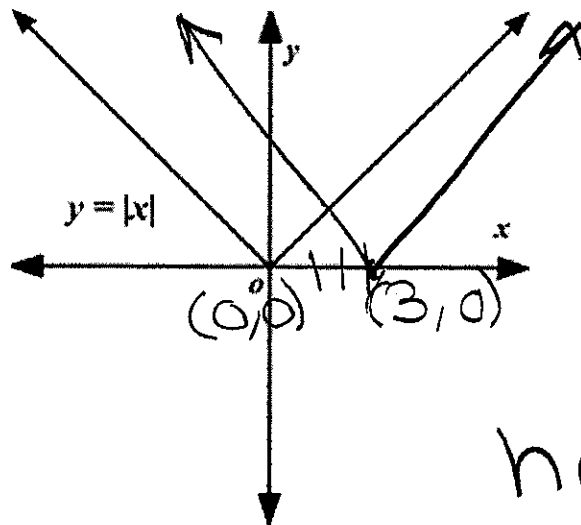
7. Sketch $y = |x+3|$.



horizontal shift

Describe how the graph of $y = |x+3|$ is related to the graph of $y = |x|$: left 3 units

8. Sketch $y = |x-3|$.



horizontal shift

Describe how the graph of $y = |x-3|$ is related to the graph of $y = |x|$: right 3 units

Translation (Shift) Rules for $f(x)$ graph	
$f(x) + k$	up k units
$f(x) - k$	down k units
$f(x + h)$	left h units
$f(x - h)$	right h units

Vertex form of a Quadratic Equation: $y = a(x-h)^2 + k$

- h represents a horizontal shift
- k represents a vertical shift

Name: _____

Unit 6B

Date: _____

Lesson 13

EXIT TICKET

Describe how the graph of each function is related to the graph of $f(x)=x^2$.

a) $g(x) = f(x) + 10$ up 10 units	b) $g(x) = (x-3)^2 + 2$ right 3 up 2	c) $g(x) = f(x+3) - 1$ left 3 down 1	d) $g(x) = (x-2)^2 + 6$ right 2 up 6
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Name: _____

Unit 6B

Date: _____

Lesson 13

EXIT TICKET

Describe how the graph of each function is related to the graph of $f(x)=x^2$.

a) $g(x) = f(x) + 10$	b) $g(x) = (x-3)^2 + 2$	c) $g(x) = f(x+3) - 1$	d) $g(x) = (x-2)^2 + 6$
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Name: _____

Unit 6B

Date: _____

Lesson 13

EXIT TICKET

Describe how the graph of each function is related to the graph of $f(x)=x^2$.

a) $g(x) = f(x) + 10$	b) $g(x) = (x-3)^2 + 2$	c) $g(x) = f(x+3) - 1$	d) $g(x) = (x-2)^2 + 6$
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