factor

$$y=x^2+4x+3 \qquad y=x^2+8x+15$$

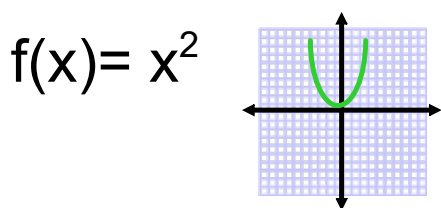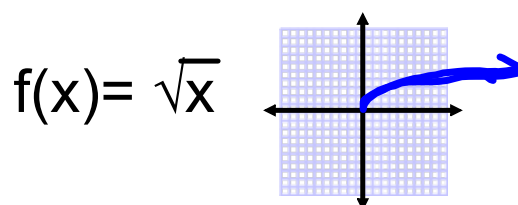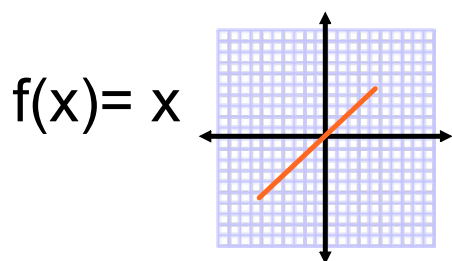$$(x+1)(x+3) \qquad (x+3)(x+5)$$

$$y=4x^2-49$$

$$(2x+7)(2x-7)$$

$\sqrt{}$ of $1^{st}$
$\sqrt{}$ of last
one $+$
one $-$

Put your homework and spiral in the basket

Clear off your desk.  ONLY pencil and calculator allowed

# Transformations

## of Parent Functions

# Parent Functions

$f(x) = x$

$f(x) = \sqrt{x}$
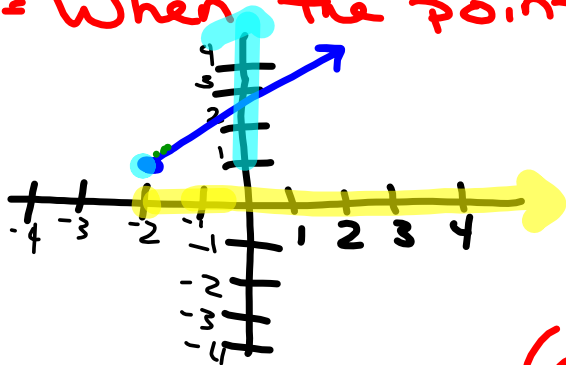
$f(x) = x^2$

$f(x) = |x|$
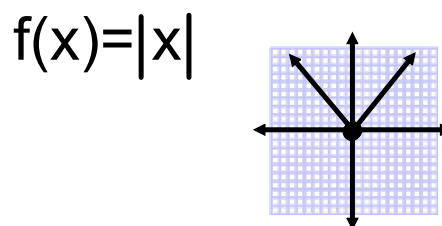
# Interval Notation

Domain = Set of all x
Range = Set of all y

( = always used for $-\infty$ / $\infty$

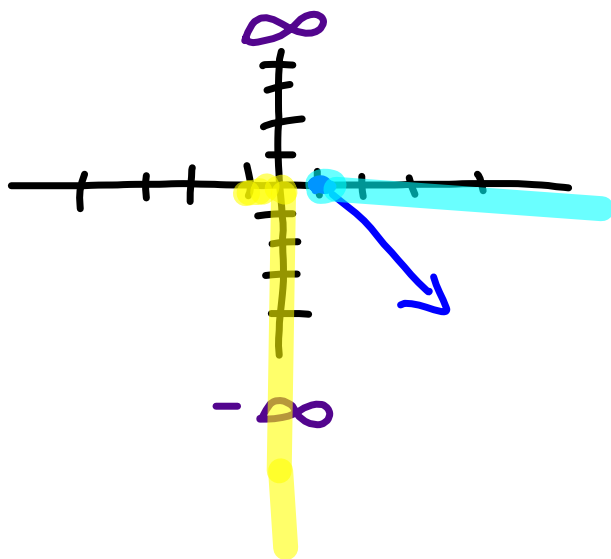   = when the point is not on the graph

[ = when the point is on the graph

$x \geq -2$
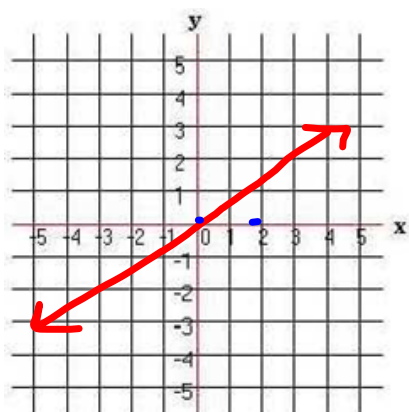
D: $[-2, \infty)$

R: $[1, \infty)$

(Smallest, largest)

D: $[1, \infty)$
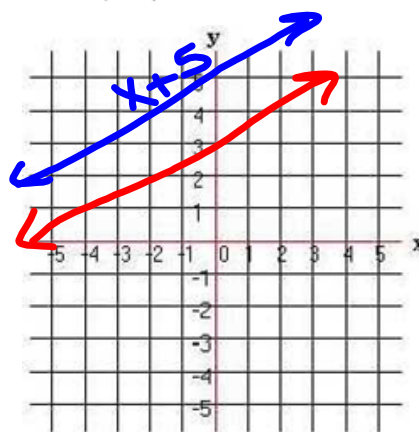
R: $(-\infty, 0]$

# **Parent Graphs: Sketch:**
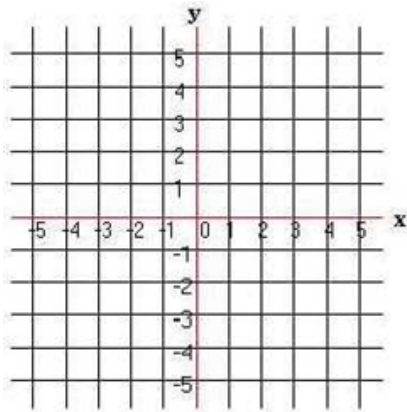
$$f(x) = x$$

$$f(x) = x + 3$$
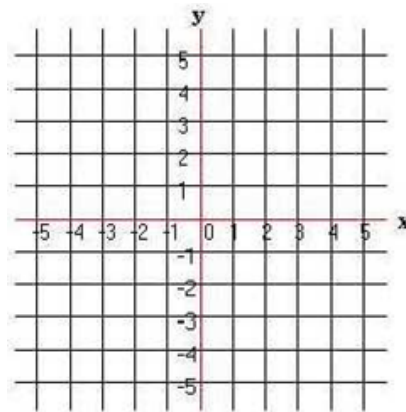
Adding to the parent function shifts the graph up.

# **Parent Graphs: Sketch:**

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

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

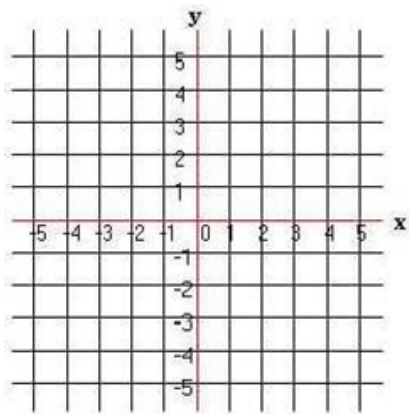Subtracting from the parent function
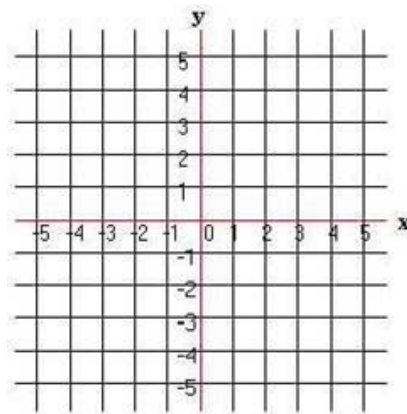Shifts the graph down

$|x| + 8$　　up 8

$\sqrt{x} - 9$　　down 9

# Parent Graphs: Sketch:

$$f(x) = |x|$$

$$f(x) = |x - 2|$$

Subtracting "inside" shifts the graph to the right.

$(x-3)^2$ right 3

$|x-4|$ right 4

$\sqrt{x-100}$ right 100
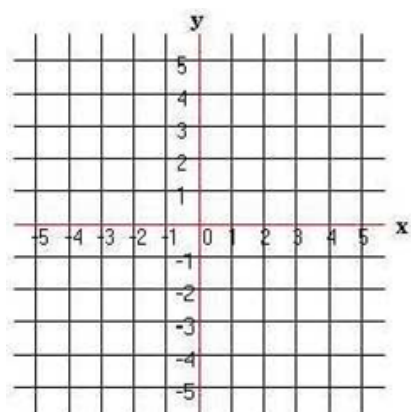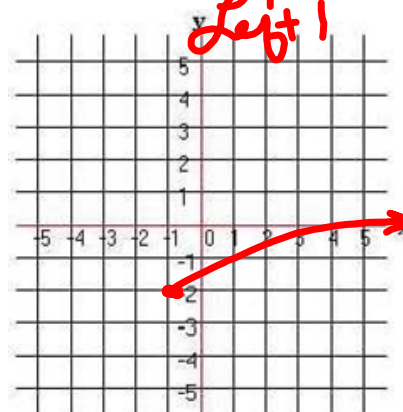
# Parent Graphs: Sketch:

$$f(x) = \sqrt{x}$$

$$f(x) = \sqrt{x+1} - 2$$

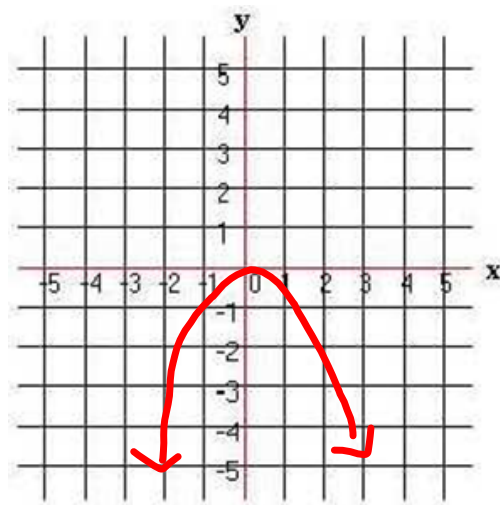Left 1   down 2

# Sketch the graph:

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



*negative outside of the parent function flips (reflects) over the X-axis*
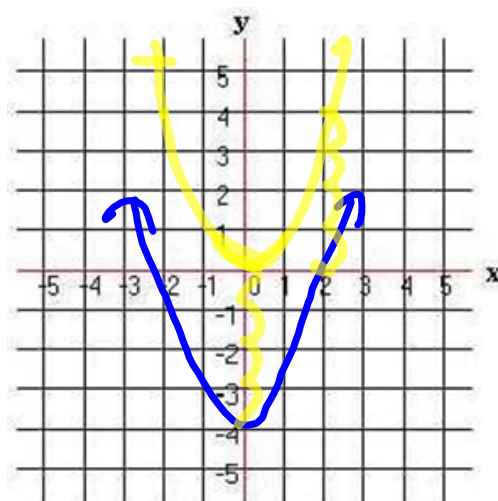
$$y_1 = \sqrt{x}$$

$$y_2 = \sqrt{-x}$$

*negative inside the parent function flips the graph over the y-axis*
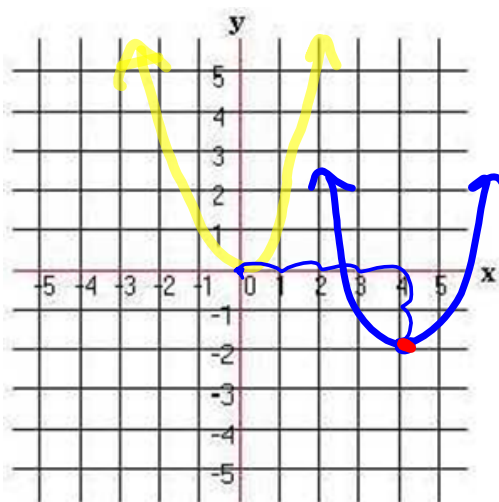
# Sketch the graph:

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

# Sketch the graph:

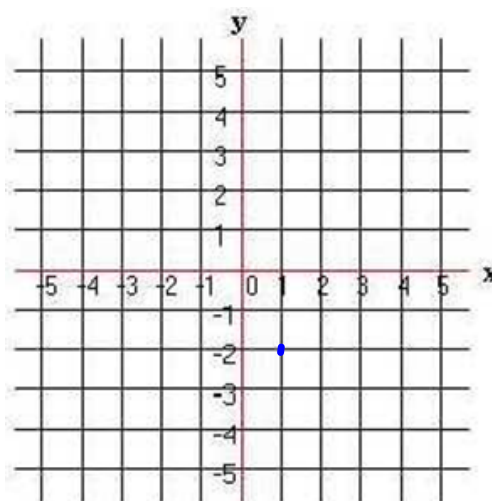$$f(x) = (x - 4)^2 - 2$$

Right 4    down 2

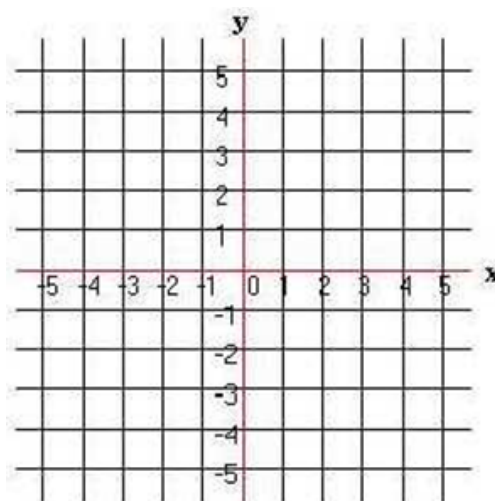Domain: $(-\infty, \infty)$

Range: $[-2, \infty)$

# Sketch the graph:

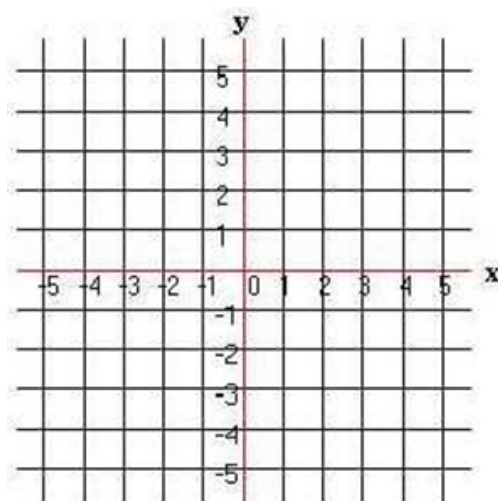$$f(x) = |x - 3| + 1$$

# Sketch the graph:
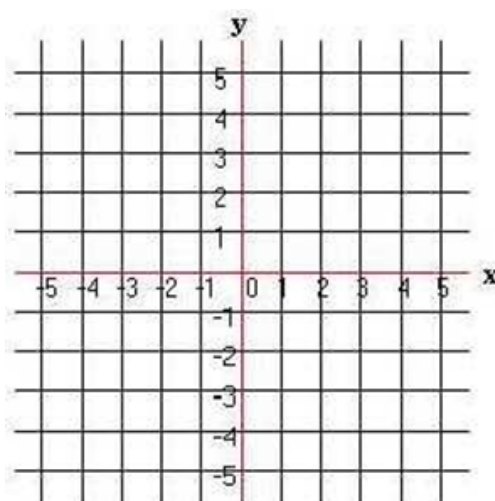
$$f(x) = \sqrt{x} + 4$$
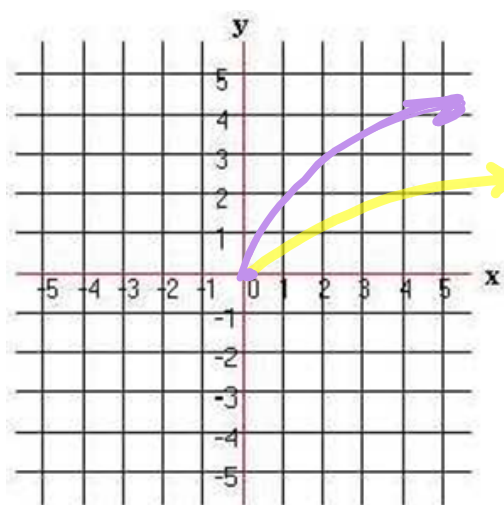
# <u>Sketch the graph:</u>

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

# Sketch the graph:

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

$$f(x) = 5\sqrt{x}$$

Domain

Range

When multiply by a # >1, the graph stretches vertically.
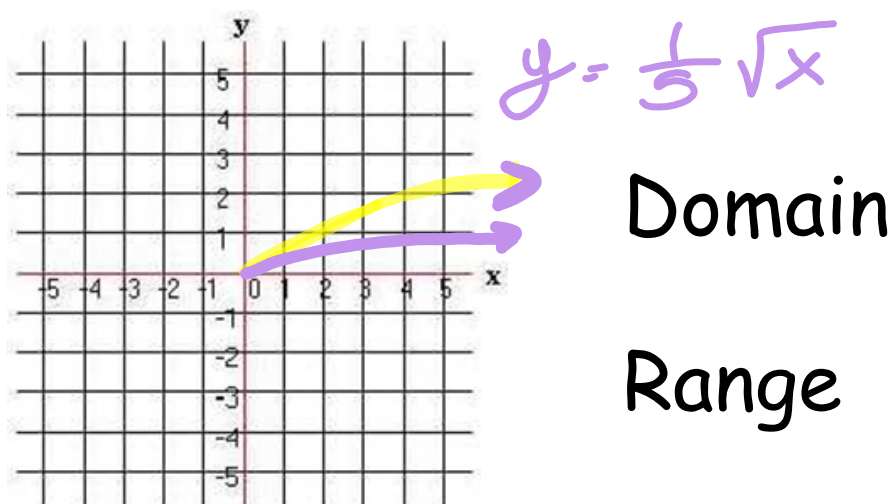
Factor

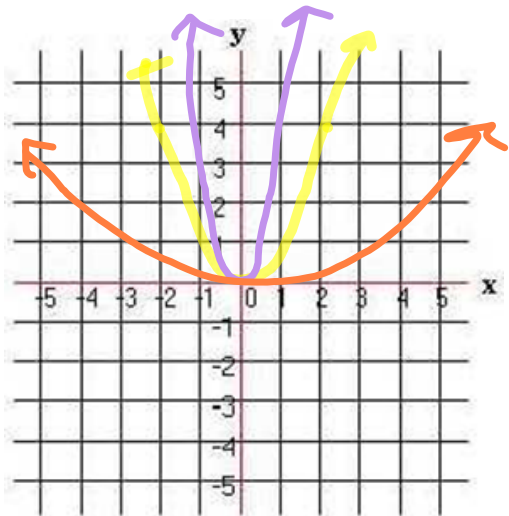$$4x^4 + 64x^2 + 240$$

$$2x^3 - 16x^2 + 24x$$

$$2n^4 + 8n^3 + 8n^2$$

Simplify

$$\sqrt{80}$$

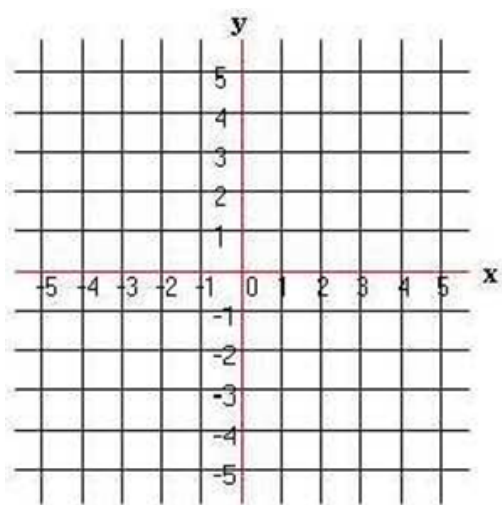$$\sqrt{175}$$

$$y = \frac{1}{5}\sqrt{x}$$

Domain

Range

When multiplying by a # between
0 and 1, the graph shrinks
vertically
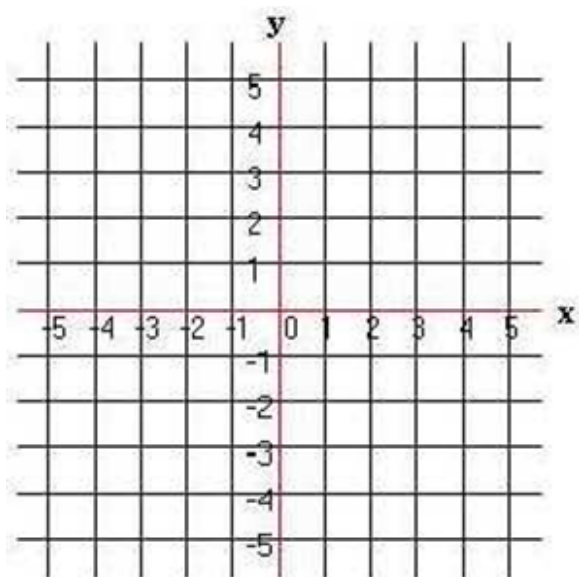
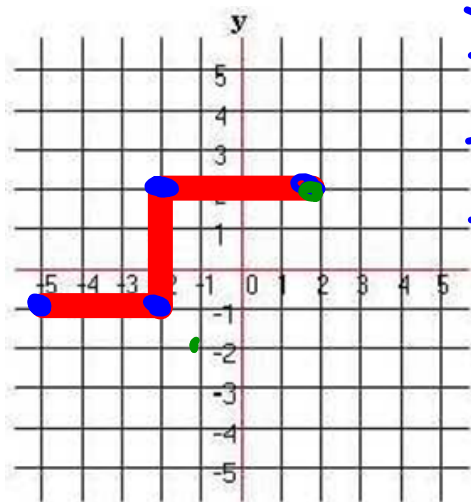$$y = 6x^2$$

$$y = \left(\frac{1}{8}\right)x^2$$

Domain

Range

Domain

Range

# Inverse Functions
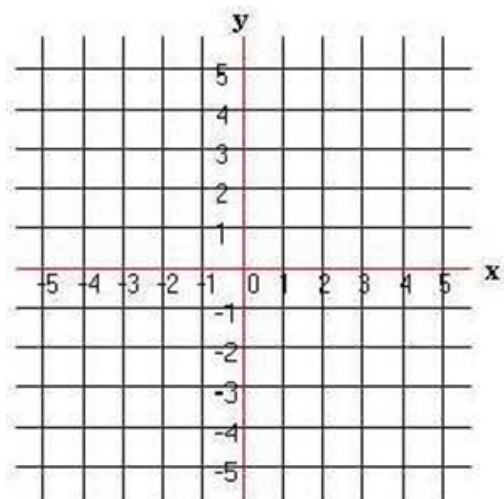
Given the graph of f(x), find $f^{-1}(x)$



| f(x) | |
|---|---|
| x | y |
| -5 | -1 |
| -2 | -1 |
| -2 | 2 |
| 2 | 2 |

Given the graph of $f(x)$,  find $f^{-1}(x)$

$$y = x + 4$$

$$y = -x + 5$$

$$g(n) = -\frac{1}{n-1}$$

$$f(n) = -\frac{3}{4}n - \frac{9}{4}$$

$$g(n) = -4n - 12$$

# Homework

\*  Worksheet