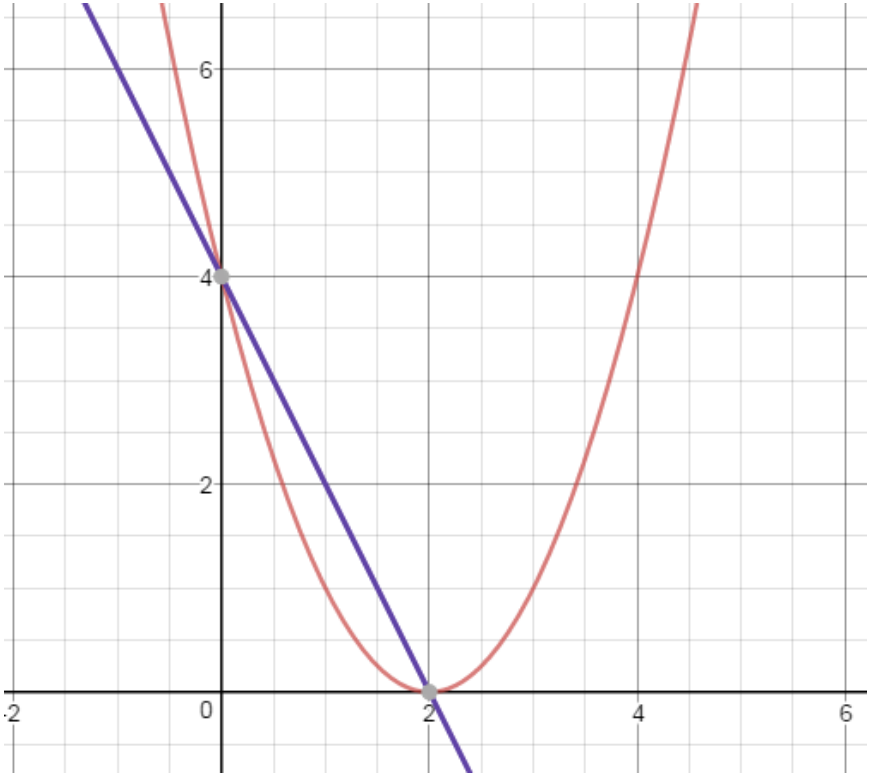
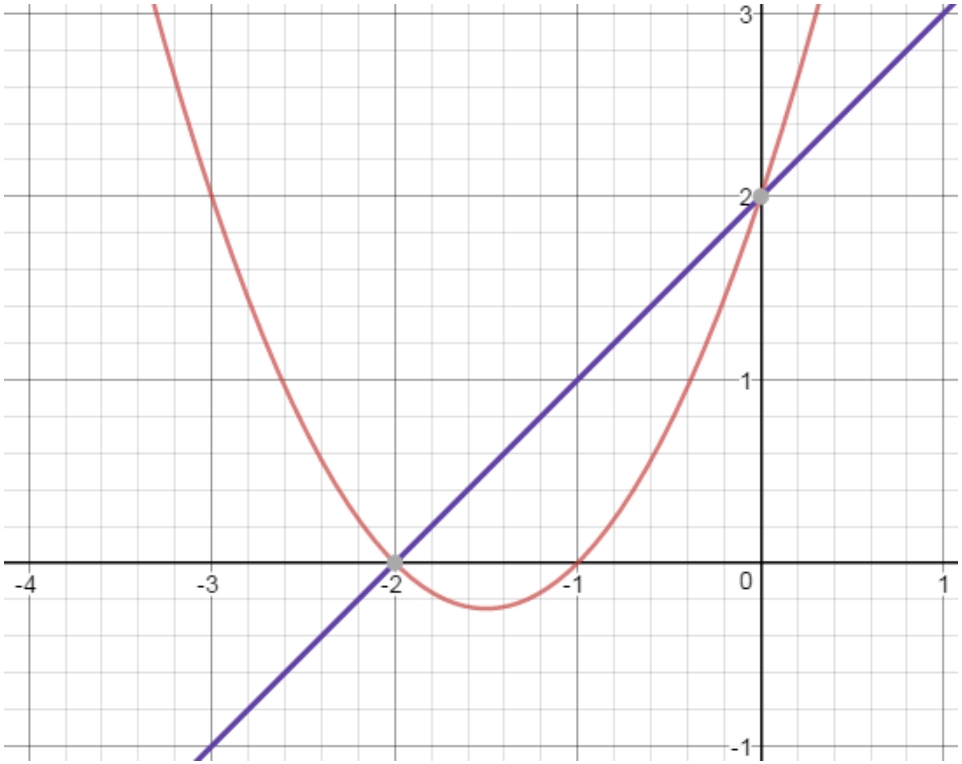
# Homework




$y = 2(x-5)^2 + 7$

$y = x^2$

$y = 2(x-5)^3 + 7$

$y = x^3$

$y = 2\sqrt{(x-5)} + 7$

$y = \sqrt{x}$

$y = 2\sqrt{x-5} + 7$

$y = \sqrt{x}$

$y = 2\log(x-5) + 7$

$y = \log(x)$

$y = 2\sin(x-5) + 7$

$y = \sin(x)$

$y = 2(x-5) + 7$

$y = x$

$y = 2e^{x-5} + 7$

$y = e^x$

# Graphing Radical Equations

**NC.M2.A-CED.2** Create and graph equations in two variables to represent quadratic, **square root** and inverse variation relationships between quantities.

**NC.M2.F-IF.4** Interpret key features of graphs, tables, and verbal descriptions in context to describe functions that arise in applications relating two quantities, including: domain and range, rate of change, symmetries, and end behavior.

**NC.M2.F-IF.7** Analyze quadratic, **square root**, and inverse variation functions by generating different representations, by hand in simple cases and using technology for more complicated cases, to show key features, including: domain and range; intercepts; intervals where the function is increasing, decreasing, positive, or negative; rate of change; maximums and minimums; symmetries; and end behavior.

# Radical Transformations

- *Use what you know about transformation to make conjectures about the following equations with parent function* $y=\sqrt{x}$. *Check your conjectures with your groups and your calculator.*

(5,0)

$y=\sqrt{x-5}$ $\quad y=(x-5)^2$

R5

$y=\sqrt{x}-6$ $\quad (0,-6)$

D6

$y=2\sqrt{x-3}+4$ $\quad (3,4)$

Vert Stretch 2 R3 U4

$y=\sqrt{3x}$

Horiz shrink $\frac{1}{3}$

$y=-\sqrt{x}-2$

$y=\frac{1}{3}\sqrt{x+4}$

- *Do the graphs look like you expected? Why or why not?*

# Practice:

- For the following equation find the:
  - Sketch the graph
  - Translation R5 U3
  - x Domain $[5, \infty)$
  - y Range $[3, \infty)$
  - End Behavior
  - Increasing Interval
  - Decreasing Interval

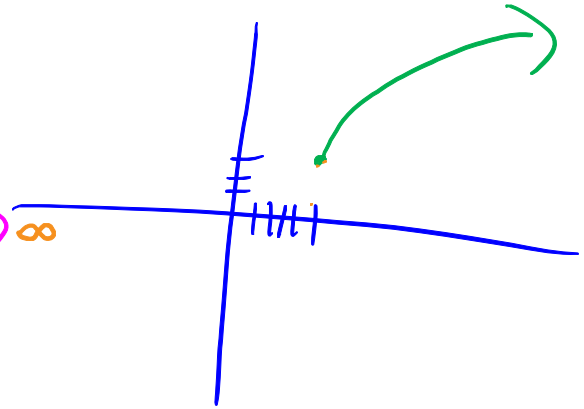
$(5, 3)$

$$y = \sqrt{x-5} + 3$$

$x \to 5 \quad y \to 3 \quad x \to \infty \quad y \to \infty$

$(5, \infty)$

N/A

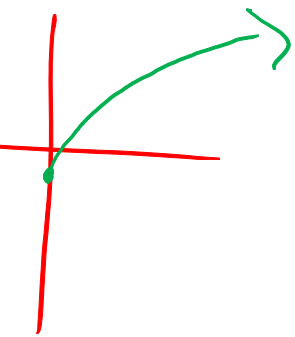


# Practice:

- For the following equation find the:
  - Sketch the graph
  - Translation Down 1
  - Domain $[0, \infty)$ Vert stretch
  - Range $[-1, \infty)$
  - End Behavior $x \to 0$ $y \to -1$ | $x \to \infty$ $y \to \infty$
  - Increasing Interval $(0, \infty)$
  - Decreasing Interval N/A

$(0, -1)$

$$y = 4\sqrt{x} - 1$$



# Practice:

- For the following equation find the:
  - Sketch the graph
  - Translation
  - Domain
  - Range
  - End Behavior
  - Increasing Interval
  - Decreasing Interval

$$y = \frac{2}{5}\sqrt{x+4}$$

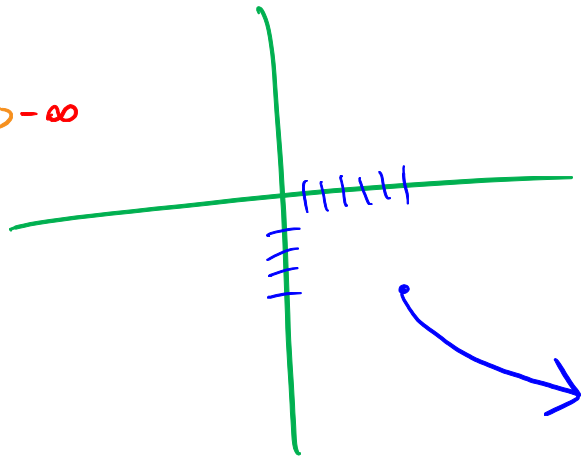
# Practice:

- For the following equation find the:
  - Sketch the graph
  - Translation R6 D4 Reflect x-axis
  - Domain $[6, \infty)$
  - Range $(-\infty, -4]$
  - End Behavior $\cdot, \cdot$ | $\rightarrow \downarrow$
    $x \to 6$ $y \to -4$ | $x \to \infty$ $y \to -\infty$
  - Increasing Interval N/A
  - Decreasing Interval

$$y = -\sqrt{x-6} - 4$$

$(6, -4)$

$(6, \infty)$

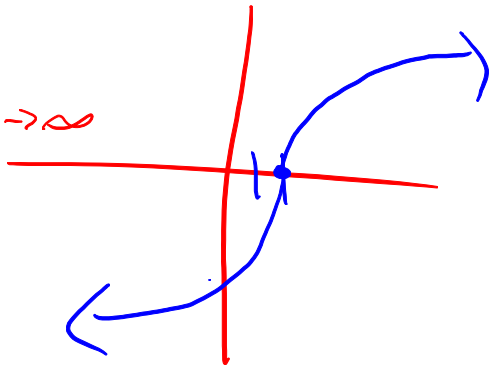


# Practice:

- For the following equation find the:
  - Sketch the graph
  - Translation R 2
  - Domain $(-\infty, \infty)$
  - Range $(-\infty, \infty)$
  - End Behavior
    $x \to -\infty \quad y \to -\infty$ | $x \to \infty \quad y \to \infty$
  - Increasing Interval $(-\infty, \infty)$
  - Decreasing Interval N/A

$$y = \sqrt[3]{x-2}$$

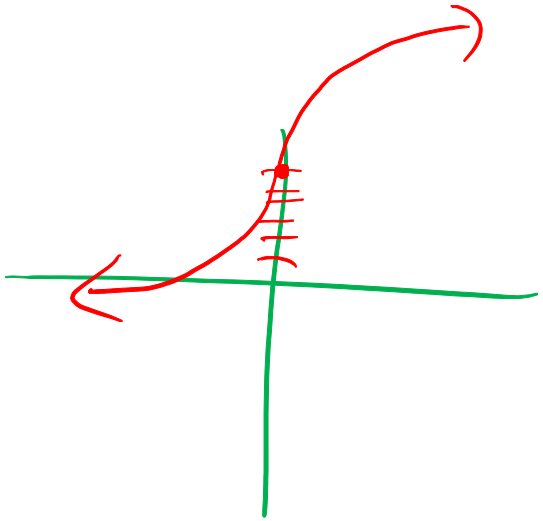
$\boxed{(2,0)}$



# Practice:

- For the following equation find the:
  - Sketch the graph (0, 6)
  - Translation UP 6
  - Domain $(-\infty, \infty)$
  - Range $(-\infty, \infty)$
  - End Behavior $x \to -\infty$ $y \to -\infty$ $x \to \infty$ $y \to \infty$
  - Increasing Interval $(-\infty, \infty)$
  - Decreasing Interval N/A

$$y = \sqrt[3]{x} + 6$$

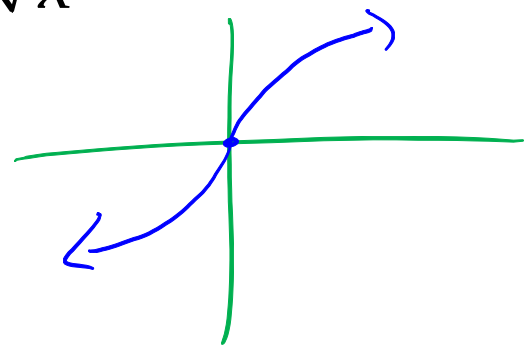


# Practice:

- For the following equation find the:
  - Sketch the graph
  - Translation Vert Stretched 2
  - Domain $(-\infty, \infty)$
  - Range $(-\infty, \infty)$
  - End Behavior $x \to -\infty \; y \to -\infty$ | $x \to \infty \; y \to \infty$
  - Increasing Interval $(-\infty, \infty)$
  - Decreasing Interval N/A

$$y = 2\sqrt[3]{x}$$

$(0,0)$

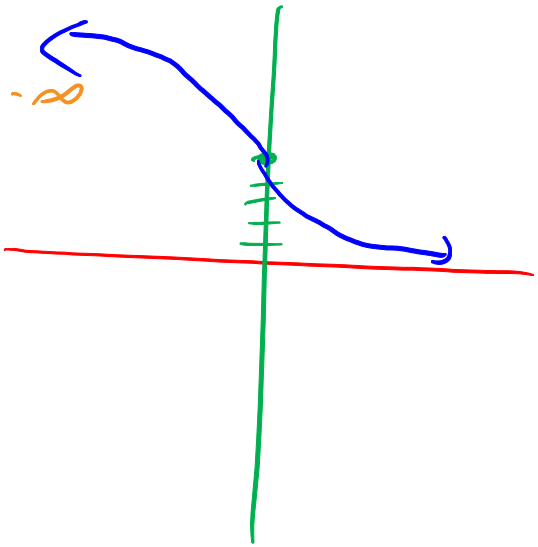


# Practice:

- For the following equation find the:
  - Sketch the graph
  - Translation Up 5 Reflect x-axis
  - Domain $(-\infty, \infty)$
  - Range $(-\infty, \infty)$
  - End Behavior $x \to -\infty$ $y \to \infty$ $x \to \infty$ $y \to -\infty$
  - Increasing Interval N/A
  - Decreasing Interval $(-\infty, \infty)$

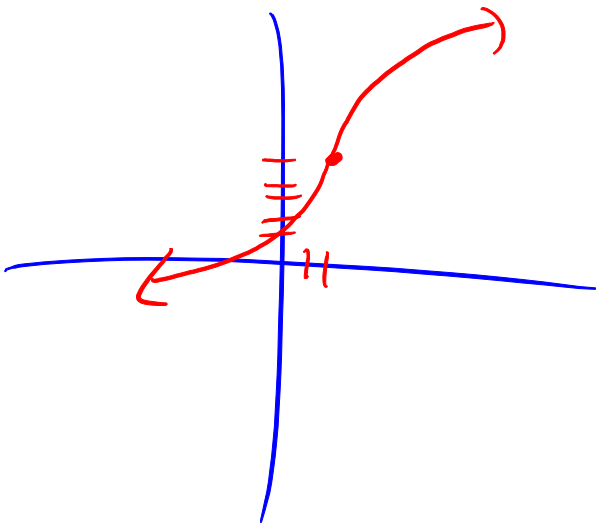
$$y = \boxed{-}\sqrt[3]{x} + 5$$

$(0, 5)$



# Practice:

- For the following equation find the:
  - Sketch the graph
  - Translation R2, U5 Vert shrink 1/4
  - Domain $(-\infty,\infty)$
  - Range $(-\infty,\infty)$
  - End Behavior $x \to -\infty$ $y \to -\infty$ $x \to \infty$ $y \to \infty$
  - Increasing Interval $(-\infty,\infty)$
  - Decreasing Interval N/A

2,5

$$y = \frac{1}{4}\sqrt[3]{x-2}+5$$