

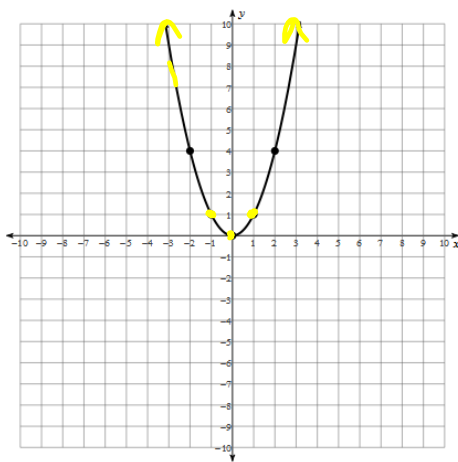
Monday 8/22/16

Quadratic and Square Root Functions

We will keep working on our "Parent Functions" book!
(so get out those too!)

PF book!

Parent Function: Quadratic
 $f(x) = x^2$



relative max: none

relative min: (0, 0)

increasing intervals: (0, ∞)

decreasing intervals: (-∞, 0)

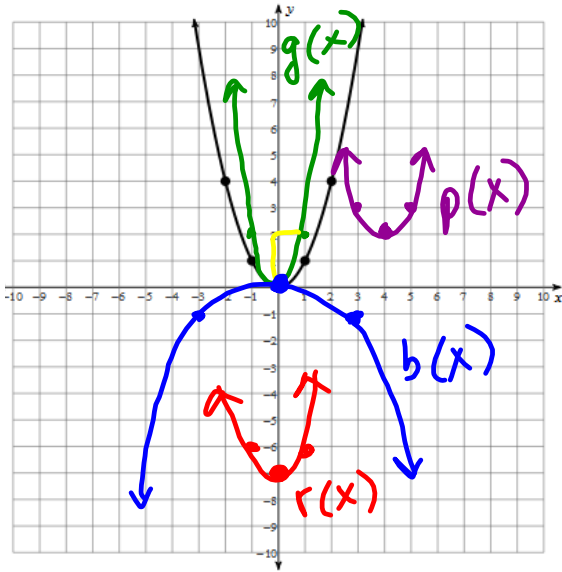
~~x~~ domain: (-∞, ∞)

range: [0, ∞)

end behavior: $x \rightarrow \infty$ $f(x) \rightarrow \infty$

$x \rightarrow -\infty$ $f(x) \rightarrow \infty$

Notes sheet:



$$g(x) = 2x^2$$

stretch 2

$$r(x) = x^2 - 7$$

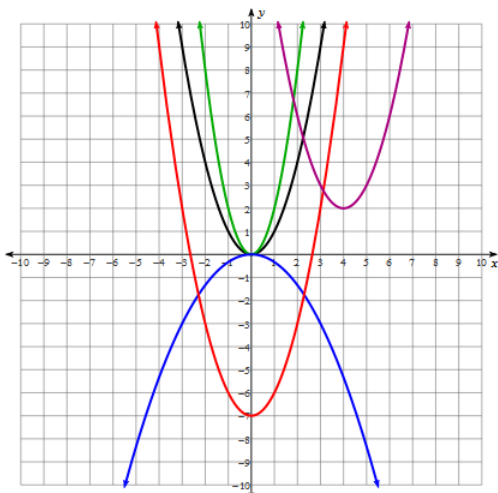
down 7

$$b(x) = -\frac{1}{3}x^2$$

stretch $\frac{1}{3}$
flips

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

right 4
up 2



$$g(x) = 2x^2$$



$$b(x) = -\frac{1}{3}x^2$$



$$r(x) = x^2 - 7$$

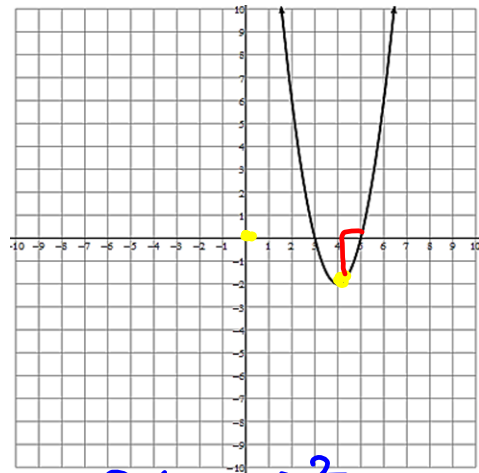


$$p(x) = (x-4)^2 + 2$$



$Q(x) =$ **flipped** **stretched** $(x \pm$ **left/right** $)^2 \pm$ **up/down**

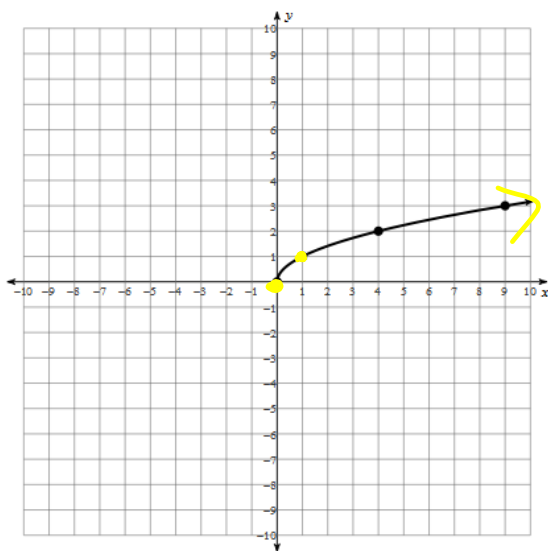
Parent Function: $f(x) = x^2$
 Transformations: right 4
down 2 stretch 2
 Domain: $(-\infty, \infty)$
 Range: $[-2, \infty)$
 Relative Extrema: min (4, -2)
 Increasing Interval(s): $(4, \infty)$
 Decreasing Interval(s): $(-\infty, 4)$
 End Behavior: $x \rightarrow \infty \quad f(x) \rightarrow \infty$
 $x \rightarrow -\infty \quad f(x) \rightarrow \infty$



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

PF BOOK

Parent Function: Square Root
 $f(x) = \sqrt{x}$



relative max: none

relative min: none

increasing intervals: $(0, \infty)$

decreasing intervals: none

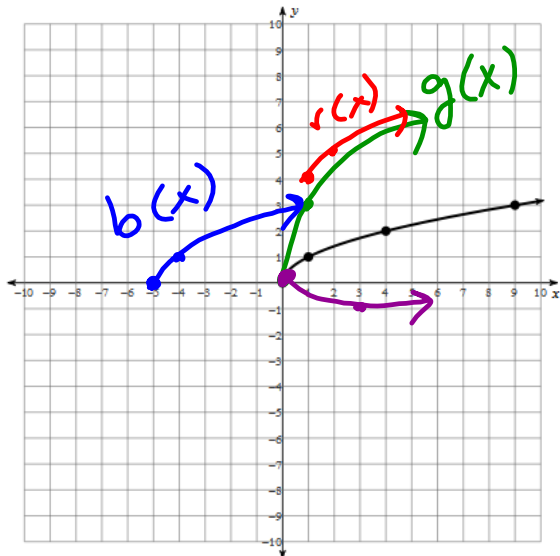
domain: $[0, \infty)$

range: $[0, \infty)$

end behavior: $x \rightarrow \infty \quad f(x) \rightarrow \infty$

$x \rightarrow -\infty \quad f(x) \rightarrow \text{none}$

Notes sheet:



$$g(x) = 3\sqrt{x}$$

Stretch 3

$$r(x) = \sqrt{x-1} + 4$$

up 4
right 1

$$b(x) = \sqrt{x+5}$$

left 5

$$p(x) = -\frac{1}{3}\sqrt{x}$$

Stretch $\frac{1}{3}$
flipped



$$g(x) = 3\sqrt{x}$$



$$b(x) = \sqrt{x+5}$$



$$r(x) = \sqrt{x-1} + 4$$



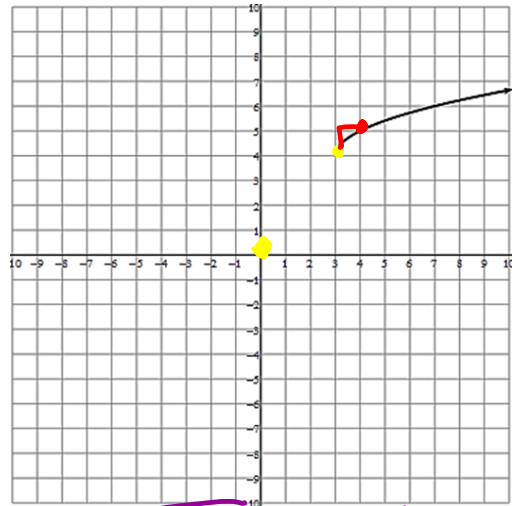
$$p(x) = -\frac{1}{3}\sqrt{x}$$



$S(x) =$ **flipped** **stretched** $\sqrt{x \pm \text{left/right}} \pm$ **up/down**

Parent Function: _____
 Transformations: up 4, right 3

 Domain: _____
 Range: _____
 Relative Extrema: _____
 Increasing Interval(s): _____
 Decreasing Interval(s): _____
 End Behavior: $x \rightarrow \infty \quad f(x) \rightarrow$ _____
 $x \rightarrow -\infty \quad f(x) \rightarrow$ _____

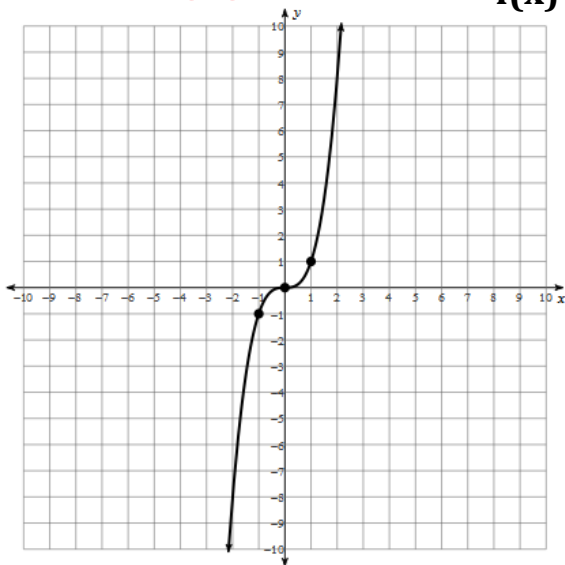


$f(x) = \sqrt{x-3} + 4$

PF Book

Parent Function: Cubic

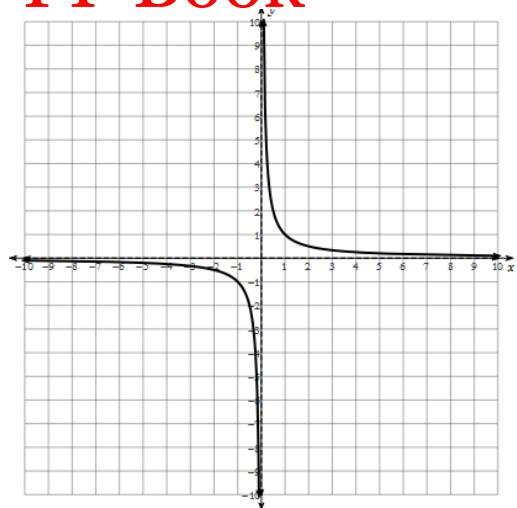
$f(x) = x^3$



relative max: none
 relative min: none
 increasing intervals: $(-\infty, \infty)$
 decreasing intervals: none
 domain: $(-\infty, \infty)$
 range: $(-\infty, \infty)$
 end behavior: $x \rightarrow \infty \quad f(x) \rightarrow \infty$
 $x \rightarrow -\infty \quad f(x) \rightarrow -\infty$

PF Book**Parent Function: Rational**

$$f(x) = \frac{1}{x}$$

relative max: nonerelative min: noneincreasing intervals: nonedecreasing intervals: $(-\infty, 0) \cup (0, \infty)$ domain: $(-\infty, 0) \cup (0, \infty)$ range: $(-\infty, 0) \cup (0, \infty)$ end behavior: $x \rightarrow \infty$ $f(x) \rightarrow$ 0 $x \rightarrow -\infty$ $f(x) \rightarrow$ 0

Homework!

PRACTICE

