

# Functions 11

## Unit 2 Review Topics

# Intro to Functions

$$f(x) = 2\sqrt{x+3} - 1$$

$$\Rightarrow f(6) = 2\sqrt{6+3} - 1$$

$$\Rightarrow f(6) = 5 \text{ giving the point on the graph } (6, 5)$$

Domain and Range

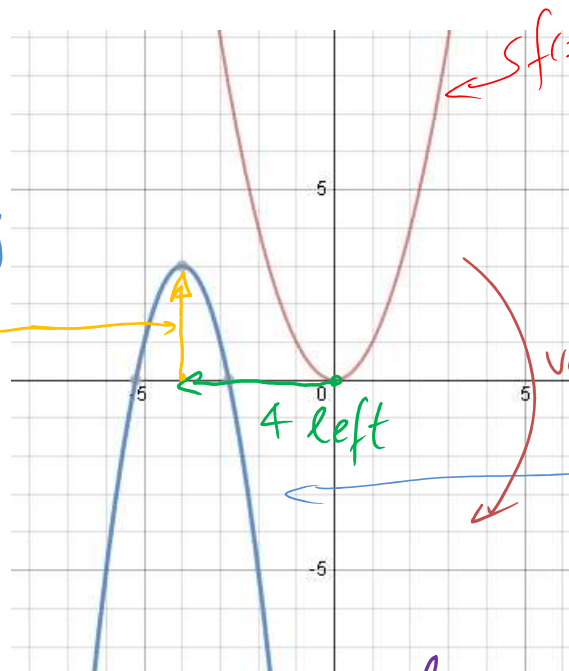
Parent Functions

Transformations

$$D_g = \{x \in \mathbb{R}\}$$

$$R_g = \{g(x) \in \mathbb{R} \mid g(x) \leq 3\}$$

3 up



$$f(x) = x^2 \text{ (PARENT)}$$

$$D_f = \{x \in \mathbb{R}\}$$

$$R_f = \{f(x) \in \mathbb{R} \mid f(x) \geq 0\}$$

vertical flip

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

vertical stretch  $\times 2$  (bit tough to 'see')

## You are expected to know:

### From Section 1.1 – Relations and Functions

- The definition of a function
- The Vertical Line Test
- Domain and Range

### From Section 1.2 – Function Notation

- Be able to calculate functional values given a function and a domain value. For example:  
Given  $f(x) = 2(x-1)^2 + 3$ , determine  $f(2)$  (Ans:  $f(2) = 5$ )
- Understand the difference between domain and range values
- Be prepared to solve a word problem using functional notation (e.g. Example 1.2.5 in the notes)

### From Section 1.3 & 1.4 – Parent Functions and Domain and Range

- The basic parent functions: Linear, Quadratics, Square Root Functions, Reciprocal Functions, and Absolute Value Functions
- Be able to state the domain and range of a relation given the sketch of its graph.
- Understand that real world problems using functions will require restricted domains and ranges (see examples 1.4.2, 1.4.3 and 1.4.4)

### From Section 1.6 – 1.8 – Transformations of Functions

- To transform something is to change it (*TRANSFORMERS...ROBOTS IN DISGUISE....*you're welcome for having that song now stuck in your head)
- The three basic types of transformations and that they can be applied to both domain values and range values.
- Given some function you need to be able to recognize the parent function and state all the transformations being applied.
- Using transformations you will need to be able to sketch a parent function along with the associated transformed function on the same set of axes (see examples 1.8.5 and 1.8.6)

### From Section 1.5 – Inverses of Functions

- That an inverse is an UNDO and “Switch domain and Range”
- How to get the equation of an inverse of a function using either Brute Force, or Transformations.

#### Practice Problems from the text:

All of your homework will help. Hopefully the following will too (Note that there is nothing on inverses here):

Pg. 76 – 77 #1, 3 (*hint: vertically flipped quadratic*), 4, 5ab, 6, 7, 8 (*use parent + transformations to help you!*), 9, 11ab, 14, 15 (*apply horizontal transformations to  $x = 1$  (the domain value of the given point) and vertical transformations to  $f(x) = 4$  (the functional value of the given point)*), 16 (*part a means “state the transformations”*), 19 (*a nice thinking question*)