

A. Lesson Context

BIG PICTURE of this UNIT:	<ul style="list-style-type: none"> • What is meant by the term FUNCTIONS and how do we work with them? • mastery with working with basics & applications of linear functions • mastery with working with basics & applications of linear systems • understanding basics of function concepts and apply them to lines & linear systems 		
CONTEXT of this LESSON:	<p>Where we've been</p> <p>In Lesson 3, you practiced with domain and range of functions</p>	<p>Where we are</p> <p>Expanding our repertoire of parent functions, beyond the linear, exponential & quadratic from IM2</p>	<p>Where we are heading</p> <p>How do we apply the concept of "functions" to linear & exponential relations.</p>

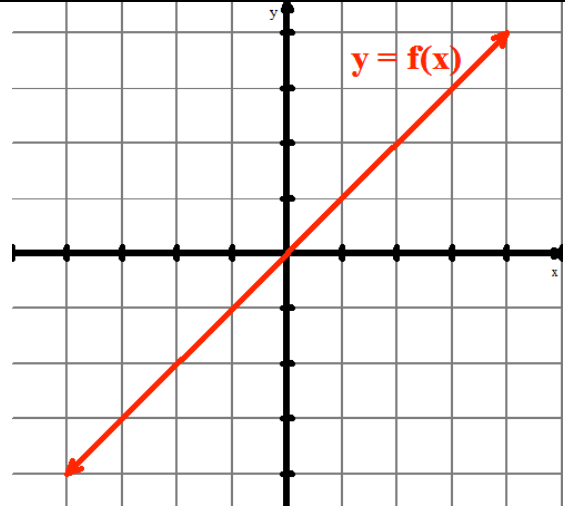
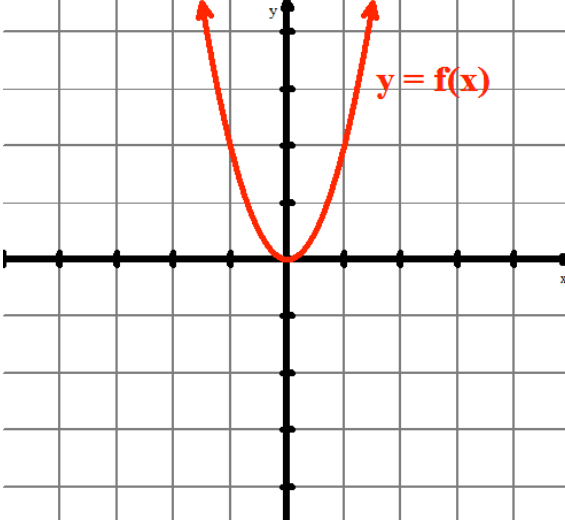
B. Lesson Objectives

- a. Generate the graphs of parent functions on technology (TI-84 & DESMOS)
- b. Relate the basics of function concepts to previously studied functions and new functions
- c. Introduce the term "parent" functions and introduce new features that characterize these new functions

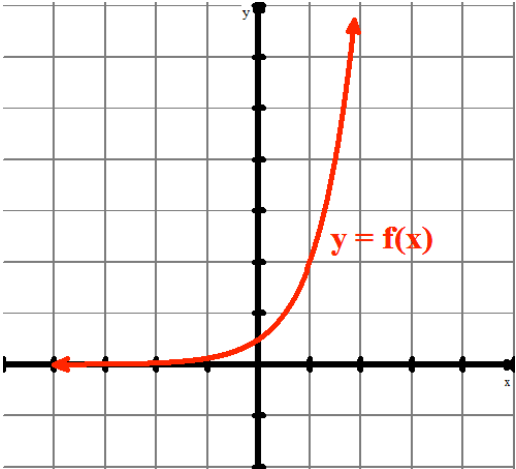
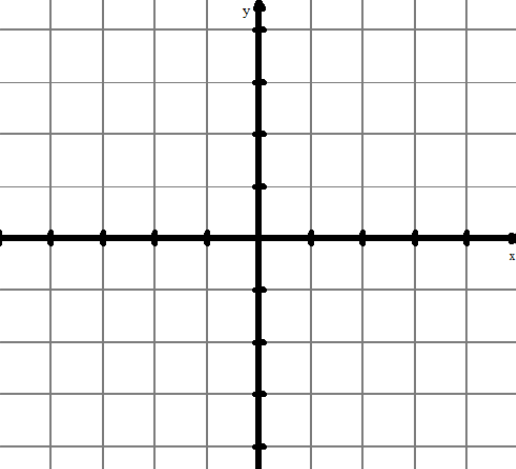
C. Fast Five (Skills Review Focus)

1. State the DOMAIN of $f(x) = 7 - 2x$ if the range is $\{y \in R \mid -3 < y \leq 15\}$
2. Draw a number line to show the number set $\{x \in R \mid x < -3 \text{ or } x \geq 5\}$
3. Solve $f(x) = 6$ if $f(x) = x^2 - x$
4. Evaluate $f\left(-\frac{3}{4}\right)$ if $f(x) = -\frac{1}{2}(x+2) + 1$

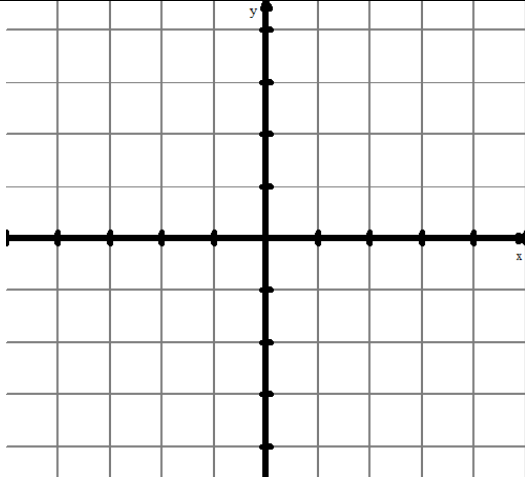
D. Observation Table for Exploration

Function Equation	Name of Parent Function	Sketch of Graph	Special Features & Symmetries	Domain	Range
$f(x) = x$	Linear		<p>Goes through origin</p> <p>Slope is 1</p> <p>Divides plane in half diagonally</p> <p>Graph only in quadrant 1 & 3</p>		
$f(x) = x^2$	Quadratic		<p>Parabola that opens up</p> <p>Vertex at the origin</p> <p>y has a minimum value</p> <p>y-axis is the line of symmetry</p> <p>graph in quad 1 & 2 only</p>		

IM3 - Lesson 4: Properties of Parent Functions | Unit 1 – Basics of Function

Function Equation	Name of Parent Function	Sketch of Graph	Special Features & Symmetries	Domain	Range
$f(x) = 2^x$	Exponential				
$f(x) = \sqrt{x}$	Square Root				

IM3 - Lesson 4: Properties of Parent Functions | Unit 1 – Basics of Function

Function Equation	Name of Parent Function	Sketch of Graph	Special Features & Symmetries	Domain	Range
$f(x) = \frac{1}{x}$	Reciprocal				
$f(x) = x $	Absolute Value	