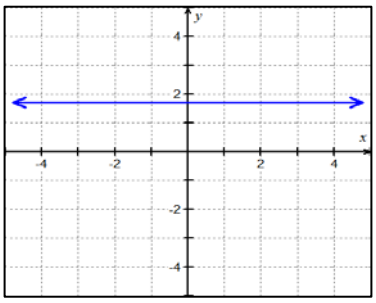
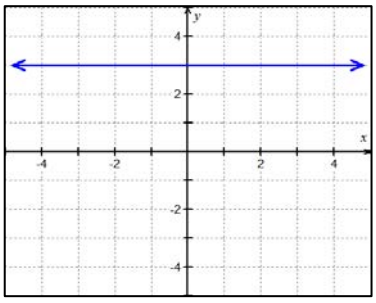
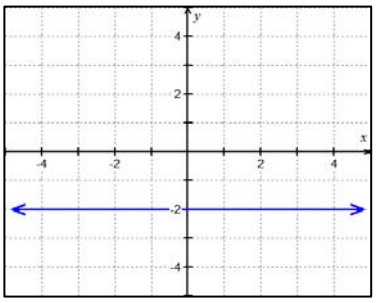
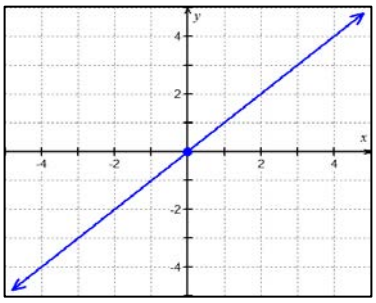
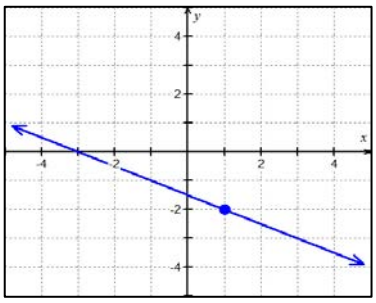
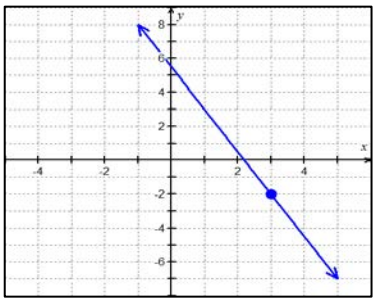
Name _____ Date _____ Period _____

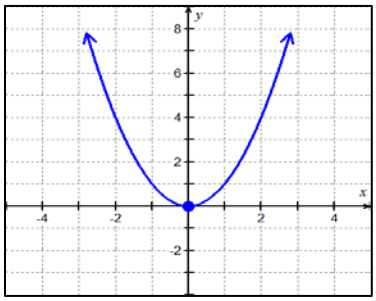
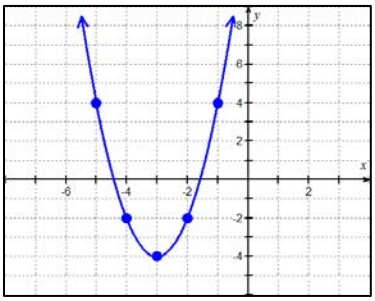
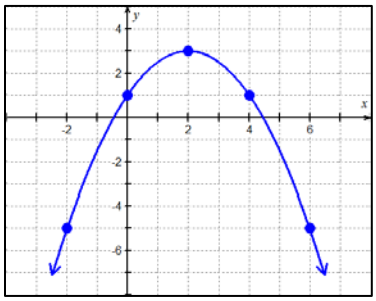
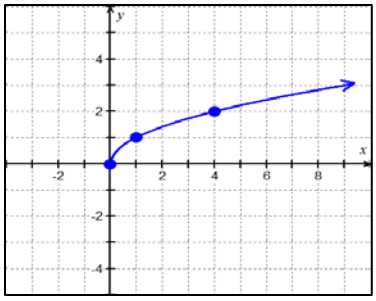
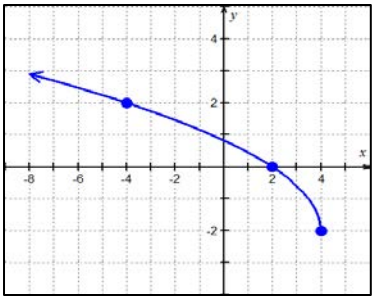
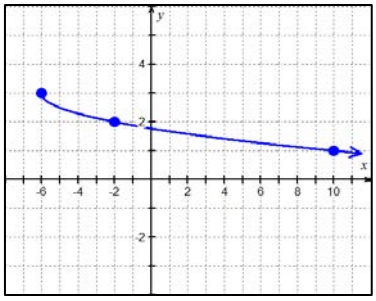
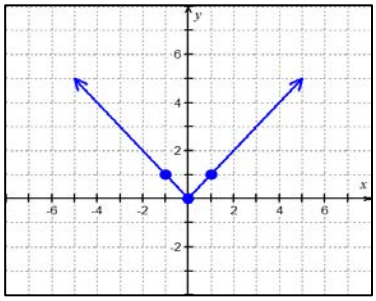
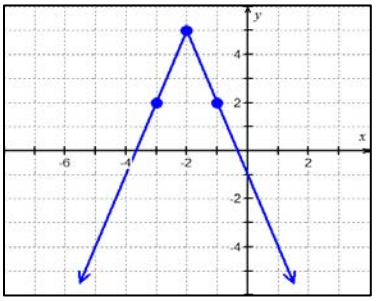
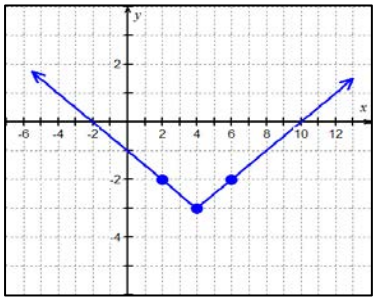
1.4 Library of Functions Homework

For problems #1–11: On each grid in the first column is the graph of a **Parent Function**. The name, general equation and domain and range of the function is given. In the next two columns, there are graphs which are transformations of the parent function.

(A) State the domain and range of each transformed function.

(B) Write an equation for each of the transformed functions $g(x)$ and $h(x)$ using standard form: $g(x) = Af\left[B(x-C)\right]+D$, where (C,D) is indicated on the graph and $A,B \in \mathbb{R}$ and $C,D \in \mathbb{Z}$.

$f(x)$	$g(x)$	$h(x)$
		
1A) **Constant Function:** $f(x) = c$ **Domain:** $x \in (-\infty,\infty)$ **Range:** $y = c$	1B) **Function equation:** $g(x) =$ **Domain:** **Range:**	1C) **Function equation:** $h(x) =$ **Domain:** **Range:**
		
2A) **Identity Function:** $f(x) = x$ **Domain:** $x \in (-\infty,\infty)$ **Range:** $y \in (-\infty,\infty)$	2B) **Function equation:** $g(x) =$ **Domain:** **Range:**	2C) **Function equation:** $h(x) =$ **Domain:** **Range:**

$f(x)$	$g(x)$	$h(x)$
		
3A) **Quadratic Function:** $f(x) = x^2$ **Domain:** $x \in (-\infty, \infty)$ **Range:** $y \in [0, \infty)$	3B) **Function equation:** $g(x) =$ **Domain:** **Range:**	3C) **Function equation:** $h(x) =$ **Domain:** **Range:**
		
4A) **Square Root Function:** $f(x) = \sqrt{x}$ **Domain:** $x \in [0, \infty)$ **Range:** $y \in [0, \infty)$	4B) **Function equation:** $g(x) =$ **Domain:** **Range:**	4C) **Function equation:** $h(x) =$ **Domain:** **Range:**
		
5A) **Absolute Value Function:** $f(x) = \lvert x \rvert$ **Domain:** $x \in (-\infty, \infty)$ **Range:** $y \in [0, \infty)$	5B) **Function equation:** $g(x) =$ **Domain:** **Range:**	5C) **Function equation:** $h(x) =$ **Domain:** **Range:**

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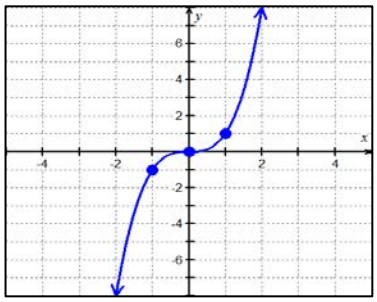
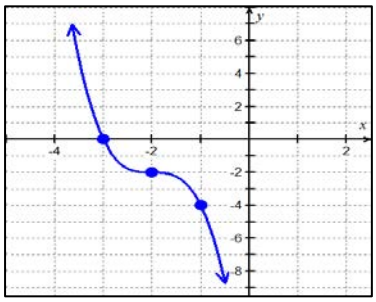
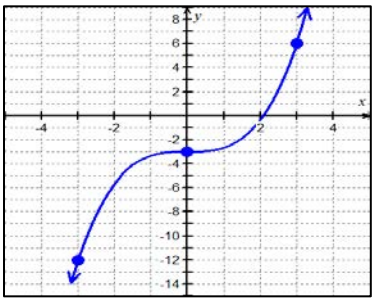
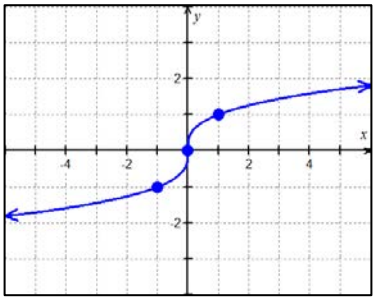
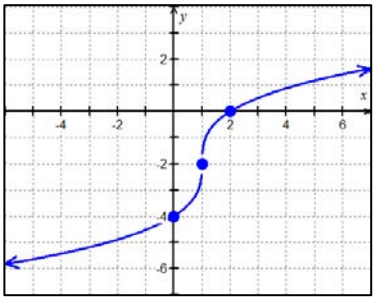
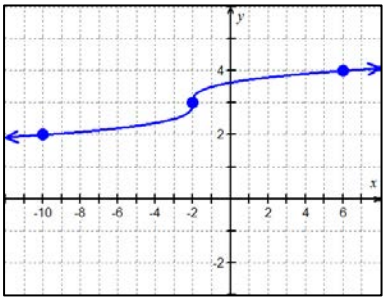
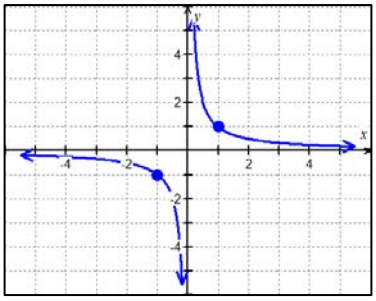
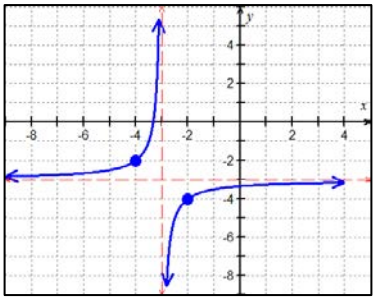
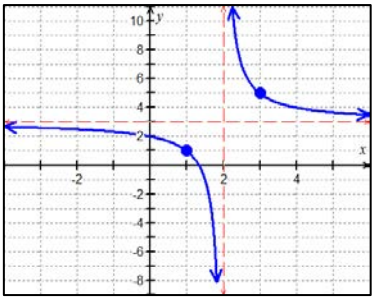
$f(x)$	$g(x)$	$h(x)$
		
6A) **Cubic Function:** $f(x) = x^3$ **Domain:** $x \in (-\infty, \infty)$ **Range:** $y \in (-\infty, \infty)$	6B) **Function equation:** $g(x) =$ **Domain:** **Range:**	6C) **Function equation:** $h(x) =$ **Domain:** **Range:**
		
7A) **Cube Root Function:** $f(x) = \sqrt[3]{x}$ **Domain:** $x \in (-\infty, \infty)$ **Range:** $y \in (-\infty, \infty)$	7B) **Function equation:** $g(x) =$ **Domain:** **Range:**	7C) **Function equation:** $h(x) =$ **Domain:** **Range:**
		
8A) **Rational Function:** $f(x) = \frac{1}{x}$ **Domain:** $x \in (-\infty, 0) \cup (0, \infty)$ **Range:** $y \in (-\infty, 0) \cup (0, \infty)$	8B) **Function equation:** $g(x) =$ **Domain:** **Range:**	8C) **Function equation:** $h(x) =$ **Domain:** **Range:**

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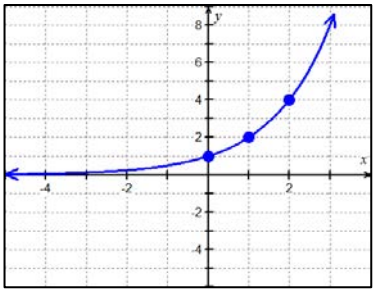
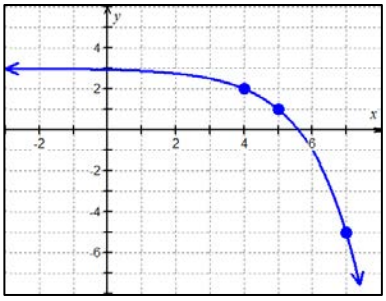
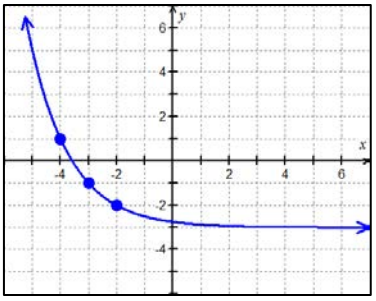
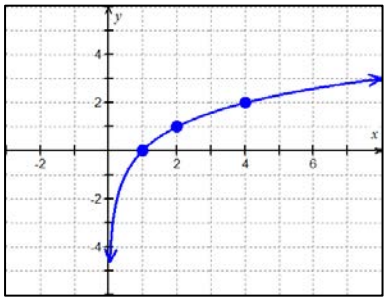
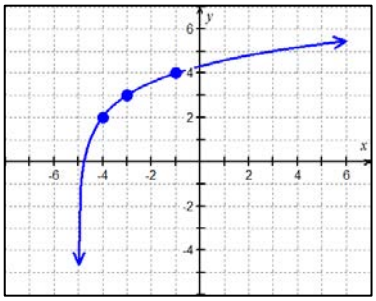
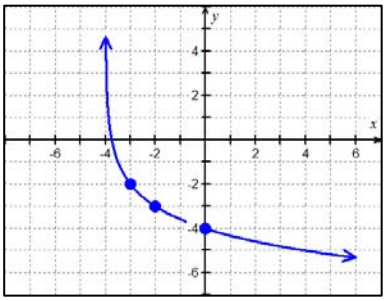
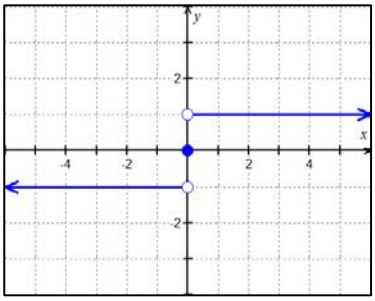
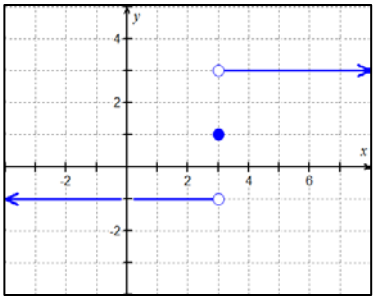
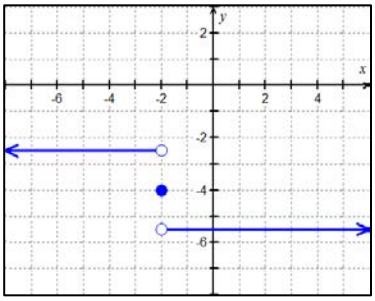
$f(x)$	$g(x)$	$h(x)$
		
9A) **Exponential Function:** $f(x) = 2^x$ **Domain:** $x \in (-\infty, \infty)$ **Range:** $y \in (0, \infty)$	9B) **Function equation:** $g(x) =$ **Domain:** **Range:**	9C) **Function equation:** $h(x) =$ **Domain:** **Range:**
		
10A) **Logarithmic Function:** $f(x) = \log_2 x$ **Domain:** $x \in (0, \infty)$ **Range:** $y \in (-\infty, \infty)$	10B) **Function equation:** $g(x) =$ **Domain:** **Range:**	10C) **Function equation:** $h(x) =$ **Domain:** **Range:**
		
11A) **Signum Function:** $f(x) = \operatorname{sgn}(x)$ **Domain:** $x \in (-\infty, \infty)$ **Range:** $y \in \{-1, 0, 1\}$	11B) **Function equation:** $g(x) =$ **Domain:** **Range:**	11C) **Function equation:** $h(x) =$ **Domain:** **Range:**

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