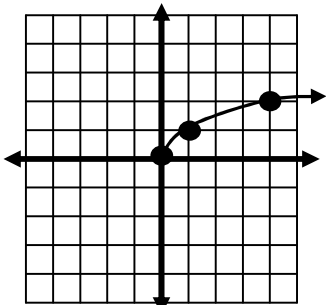
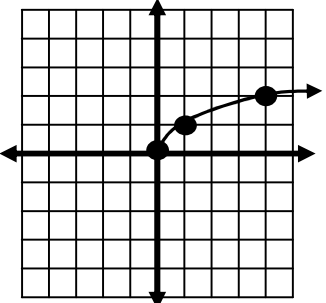
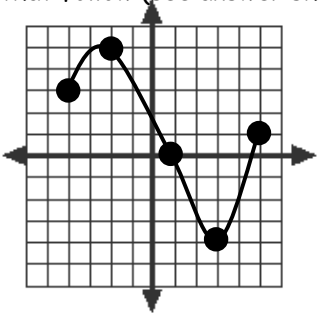
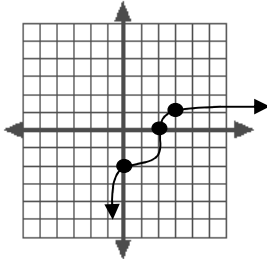
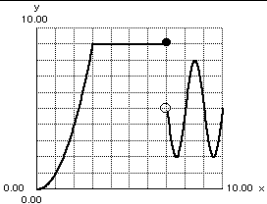
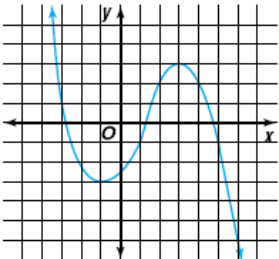
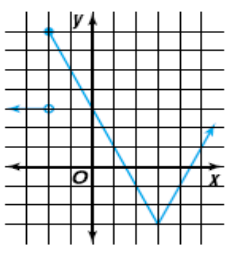


Chapter 3 Objectives

3.1 Symmetry and Coordinate Graphs	
1a) I can determine algebraically whether a function is symmetric with respect to the origin $f(-x) = -f(x)$	1a) Determine algebraically whether the graph of $f(x) = x^5 - 2x$ is symmetric about the origin
1b) I can determine whether a function is symmetric with respect to a given line, point or axis	1b) Determine when the graph of the equation is symmetric with respect to the x-axis, y-axis, line $y=x$, $y=-x$, origin or none of these i) $y = -x + 5$ ii) $xy = 7$ iii) $y = x^3 - 2x$
1c) Given a point A, I can find A' given that its symmetric about: x-axis, y-axis, $y=x$, or $y=-x$	1c) For the point A (5,-6), find A' if A and A' are symmetric about the... i) x-axis ii) y-axis iii) line $y=x$ iv) line $y=-x$ v) origin
1d) Given a graph, I can sketch a complete graph for its given symmetry	1d) The graph below is a portion of a complete graph. Sketch a complete graph for each of the following symmetries i) x-axis ii) y-axis iii) line $y=x$ iv) line $y=-x$ <div style="text-align: right; margin-top: 10px;">  </div>
1e) I can determine if a function is even, odd or neither	1e) Determine if each function is an even function, odd function or neither. i) $y = -x^3$ ii) $y = \sqrt{x^2 - 9}$ iii) $y = -3x^9 + 2x^3 - 5x$
1f) I can complete a graph so that it is the graph of an even or odd function.	1f) Complete the graph so that is the graph of an... i) even function ii) odd function <div style="text-align: right; margin-top: 10px;">  </div>

3.2 Families of Graphs	
2a) I can sketch the parent graph (along with the required points) for the graphs of: identity function, quadratic function, square root function, cubic function, cube root function, reciprocal function and absolute value function	2a) Sketch the parent graph of the functions listed to the left
2b) I can identify transformations of a function	2b) Given the parent graph of $y = \sqrt{x}$, describe in words the transformations i) $y = \sqrt{x+2}$ ii) $y = -\sqrt{x-2} + 1$ iii) $y = \sqrt{-x} + 8$ iv) $y = -2\sqrt{x}$
2c) I can sketch the graph of a given function by first sketching the parent graph and then shifting the important points	2c) Graph the following - remember all the required points! i) $y = -x^2 + 4$ ii) $y = x-1 - 3$ iii) $y = \frac{2}{x+2}$ iv) $y = \sqrt[3]{x+1}$
2d) Given a graph, I can translate points according to the defined function	2d) Given the original graphed function, perform the transformations that follow (see answer sheet) <div style="text-align: center;">  </div>
3.3 Graphs of Nonlinear Inequalities	
3a) I can determine whether a given point is a solution of an inequality	3a) Is (3,-2) a solution of $3x^2 \geq 2y - 5y^2 + x$
3b) I can graph an inequality	3b) Graph the following graphs - shade!! i) $y > -(x-3)^3$ ii) $y \leq -x+5 $
3c) I can solve an absolute value inequality algebraically (and vs. or)	3c) Solve i) $ x-2 - 7 < 5$ ii) $3 + x+3 \geq 12$
3d) I can recognize special types of absolute value inequalities (all real #'s vs. no solution)	3d) Solve $ x-4 > -21$

3.4 Inverse Functions and Relations	
4a) I know that two relations are inverses if and only if their domain and range swap (meaning symmetric over the line $y=x$)	
4b) I can use the horizontal line test to determine if the inverse of a function will be a function.	4b) Is the inverse of $y = x^2 - 9$ a function?
4c) Given a function, I can find 3 (or 5) required points and from those points, I can graph its inverse	4c) Graph the given function and its inverse i) $y = \frac{4}{(x-2)^2}$ ii) $y = -4x^2 + 1$
4d) Given a function, I can find the equation of its inverse.	4d) Find the inverse of $f(x) = 2x - 5$
4e) Given a graph, I can sketch its inverse.	4e) Given the graph below, sketch its inverse 
3.5 Continuity	
5a) I can determine if a function is continuous or discontinuous by looking at its graph.	5a) 
5b) I can determine the type and location of a discontinuity.	5b) Determine if the function has a discontinuity. If yes, determine the type and location. i) $y = \frac{2}{(x-2)^2}$ ii) $y = \frac{x+1}{x^2+x}$
5c) I can determine if a function is continuous at a given x-value.	5c) Determine whether the function is continuous at the given x-value. i) $f(x) = \frac{x^2}{x-2}$ when $x = 2$ ii) $f(x) = \begin{cases} x+1 & \text{if } x > 0 \\ 1 & \text{if } x \leq 0 \end{cases}$ when $x = 0$
5d) I can complete a fragmented function so that it is continuous	5d) Complete the fragmented function so that the function is continuous: $f(x) = \frac{x^2 - 4x - 5}{x+1}$ $f(\) = \underline{\hspace{2cm}}$
5e) I can describe the end behavior of polynomials	5e) Describe the end behavior of each function: i) $y = x^3 + 3x^2 + x - 2$ ii) $y = 5 - x^4$

3.6 Critical Points and Points of Inflection	
6a) I can locate and classify critical points by looking at a graph	6a) Locate the critical points for the graph of $y=f(x)$. Name and classify the critical points of the function. i)  i) 
6b) I can use my calculator to locate and classify critical points (CALC 3 or 4) of a function.	6b) Find the location of critical points of each function. Then classify the critical points. i) $y = -x^2 + 8x - 10$ ii) $y = x^3 - 9x^2 + 27x - 27$
6c) I can differentiate between relative and absolute extrema of a function.	6c) Explain.
3.7 Holes and Asymptotes	
7a) Given a function, I can write the equation of the vertical, horizontal, and slant asymptotes.	7a) Determine the equations of the vertical, horizontal and slant asymptotes of each equation i) $f(x) = \frac{x}{x^2 - 4}$ ii) $f(x) = \frac{x^3 - 2x^2 + 5}{x^2 - 9}$
7b) Given a function, I can locate any holes and write it as a coordinate.	7b) Determine if the function has a hole. If yes, express your answer as an ordered pair. i) $f(x) = \frac{x^2 + 2x - 3}{x^2 - x}$ ii) $f(x) = \frac{6x + 24}{x^2 - 7x + 12}$
7c) I can sketch the graph of a function (without a calculator) by finding any holes, vertical, horizontal, slant asymptotes, and y intercept.	7c) Sketch the graph of the function below including any asymptotes, holes, and y intercept: i) $f(x) = \frac{x + 2}{x^2 - 4}$ ii) $f(x) = \frac{x^2 + 4x + 4}{x + 2}$
3.8 Direct, Inverse and Joint Variation	
8a) I can write the general formula for direct, inverse, and joint variation.	8a) Know these!
8b) I can find the constant of variation (k) given x and y.	8b) i) Given y varies directly as x, find the constant of variation if $y = 16$ when $x = 4$ ii) Given y varies jointly as x and z, find the constant of variation if $y = 24$ when $x = 3$ and $z = 5$.
8c) Given a variation statement and values for x and y, I can use the equation to solve a problem.	8c) i) If y varies directly as x, and $y = 0.5$ when $x = 2$, find y when $x = 10$. ii) If y varies inversely as the square of x, and $y = 8$ when $x = 3$, find x when $y = 18$.

