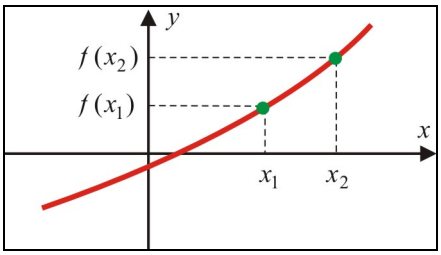
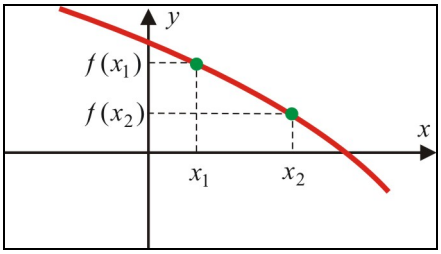
4.1 Increasing and Decreasing Functions

A Increasing and Decreasing Functions

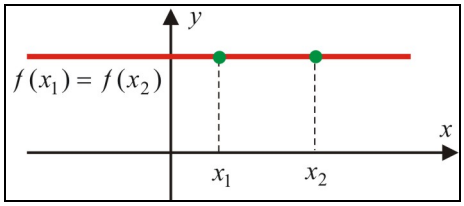
A function f is *increasing* over the interval (a,b) if $f(x_1) < f(x_2)$ whenever $x_1 < x_2$ in the interval (a,b).



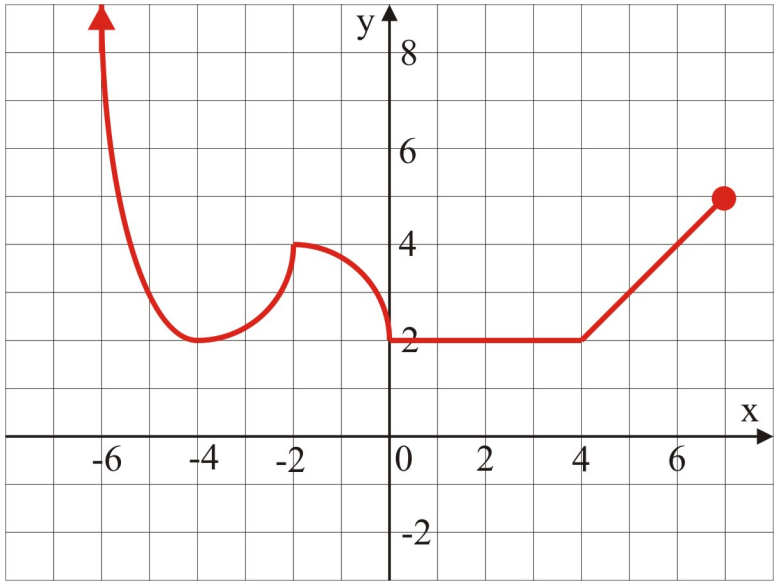
A function f is *decreasing* over the interval (a,b) if $f(x_1) > f(x_2)$ whenever $x_1 < x_2$ in the interval (a,b).



A function f is *constant* over the interval (a,b) if $f(x_1) = f(x_2)$ for every x_1 and x_2 in the interval (a,b).



Ex 1. Find the intervals where the function $y = f(x)$ is increasing, decreasing, or is constant.



B Test for Intervals of Increase or Decrease

Let $y = f(x)$ be a differentiable function over (a,b). Then:

If $f'(x) > 0$ for all $x \in (a,b)$ then f is *increasing* over (a,b).

If $f'(x) < 0$ for all $x \in (a,b)$ then f is *decreasing* over (a,b).

If $f'(x) = 0$ for all $x \in (a,b)$ then f is *constant* over (a,b).

Ex 2. Find the intervals of increase or decrease for $f(x) = 2x^3 + 3x^2 - 12x$.

Ex 3. Find the intervals of increase or decrease for $f(x)=\frac{2}{x}-\frac{1}{x^2}$.	Ex 4. Find the intervals of increase or decrease for $f(x)=\frac{x}{x^2+1}$.
Ex 5. Find the intervals of increase or decrease for $f(x)=(x-2)\sqrt[3]{x^2}$.	

Reading: Nelson Textbook, Pages 165-169
Homework: Nelson Textbook: Page 169 #1cd, 3bc, 5, 7, 8, 11

