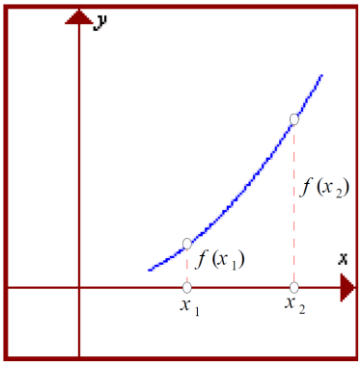
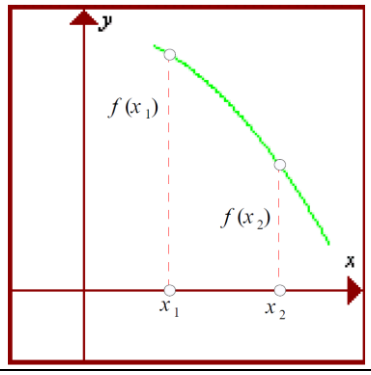
Name: **Date:**

3 – 4.1 Increasing and Decreasing Functions

Lesson Goals:

- Be able to determine when a function is increasing or decreasing

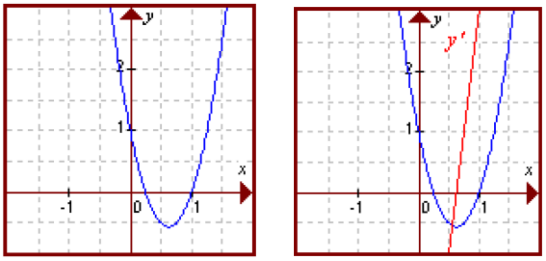
1) Increasing and Decreasing Function

Increasing Function	Decreasing Function
f is increasing on an interval I if $f(x_1) < f(x_2)$ whenever $x_1 < x_2$ in I	f is decreasing on an interval I if $f(x_1) > f(x_2)$ whenever $x_1 < x_2$ in I
	

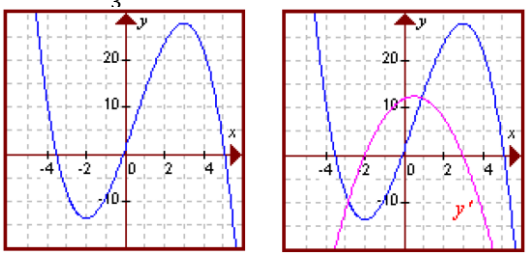
- How to test for increasing and decreasing functions:
  - If $f'(x) > 0$ for all x on an interval I, then f is increasing on I.
  - If $f'(x) < 0$ for all x on an interval I, then f is decreasing on I.

Example 1: Find the intervals of increase or decrease of each of the following functions.

a) $y = 4x^2 - 5x + 1$



b) $y = -\frac{2}{3}x^3 + x^2 + 12x - 1$



Example 2: Determine where $y = (x+1)^4 e^{-x}$ is increasing or decreasing.

Example 3: Determine when $y = (\ln(x))^2$ is increasing or decreasing.

Example 4: Determine where $y = sin2x$ is increasing or decreasing on the interval $[0,2\pi]$.

Homework: Page 169 #1, 3-8, 9 (skip iii.), 10