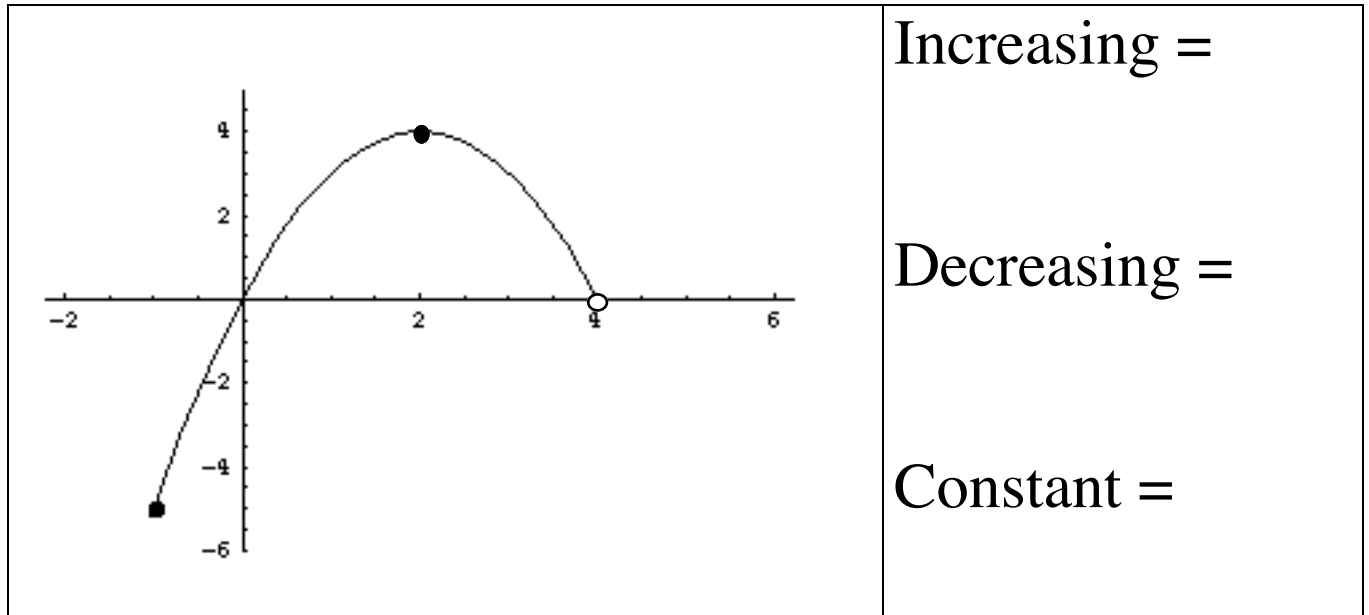


§ 3.3 Properties of Functions



Increasing Function: A function where as x-values increase so do the y-values.

(Note: graph will rise up to the right)

Example: Graph $y = 2x + 5$

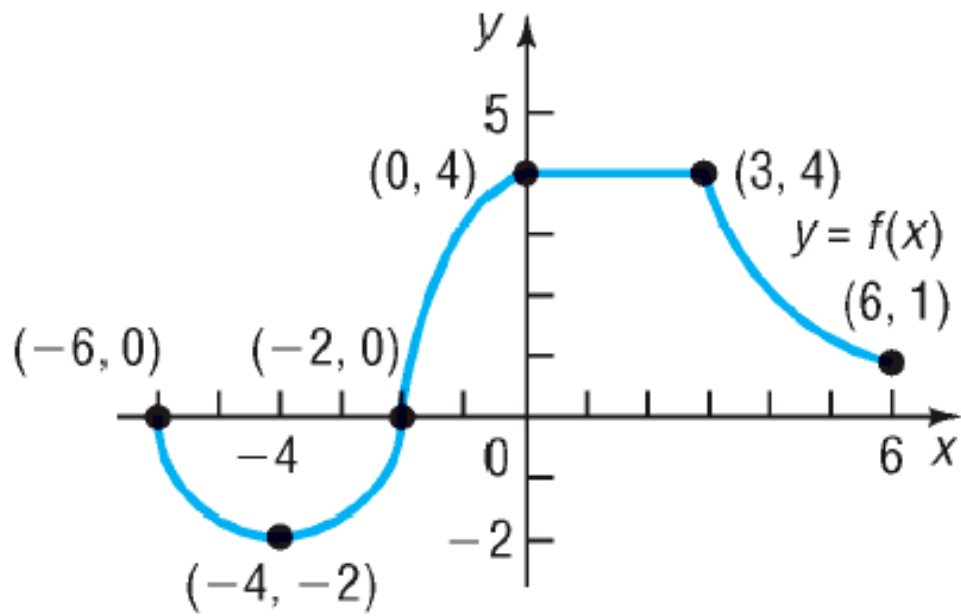
Decreasing Function: A function where as x-values increase y-values decrease.

(Note: graph will fall down to the right)

Example: Graph $y = -x + 4$

Constant function: The graph is a flat horizontal line.

Example: Graph $y = 3$



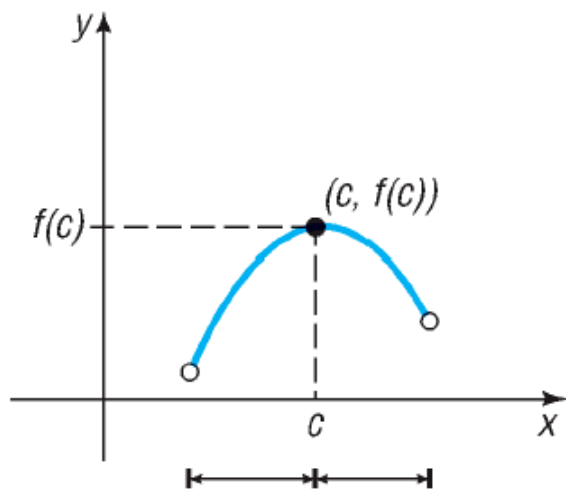
Where is the function increasing?

Where is it decreasing?

Where is it constant?

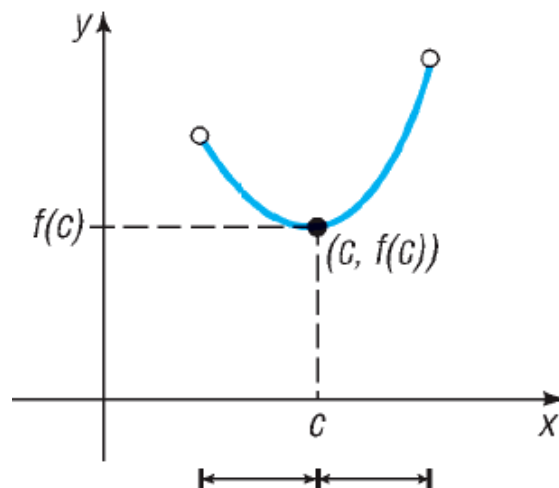
LOCAL MAXIMA

LOCAL MINIMA



increasing decreasing

The local maximum is $f(c)$ and occurs at $x = c$.

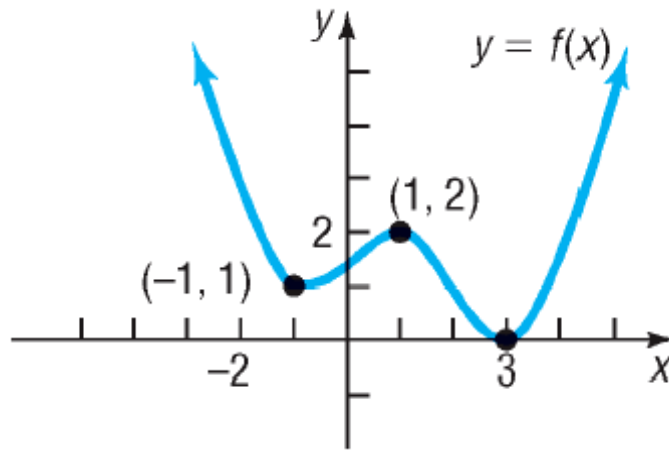


decreasing increasing

The local minimum is $f(c)$ and occurs at $x = c$.

A function f has a **local maximum** at c if there is an open interval I containing c so that, for all $x \neq c$ in I , $f(x) \leq f(c)$. We call $f(c)$ a **local maximum of f** .

A function f has a **local minimum** at c if there is an open interval I containing c so that, for all $x \neq c$ in I , $f(x) \geq f(c)$. We call $f(c)$ a **local minimum of f** .



- At what number(s), if any, does f have a local maximum?
- What are the local maxima?
- At what number(s), if any, does f have a local minimum?
- What are the local minima?
- List the intervals on which f is increasing. List the intervals on which f is decreasing.