Global Maxima and Minima

Definition: We say that $f(x)$ has a local minimum at $x = c$ if $f(c)$ is less than or equal to all other values of $f(x)$ near c.

Definition: We say that $f(x)$ has a local maximum at $x = c$ if $f(c)$ is greater than or equal to all other values of $f(x)$ near c.

Remark: We saw that for both the local maximum and minimum that $f'(x) = 0$. If $f'(c) = 0$ then $x = c$ is a critical pt.

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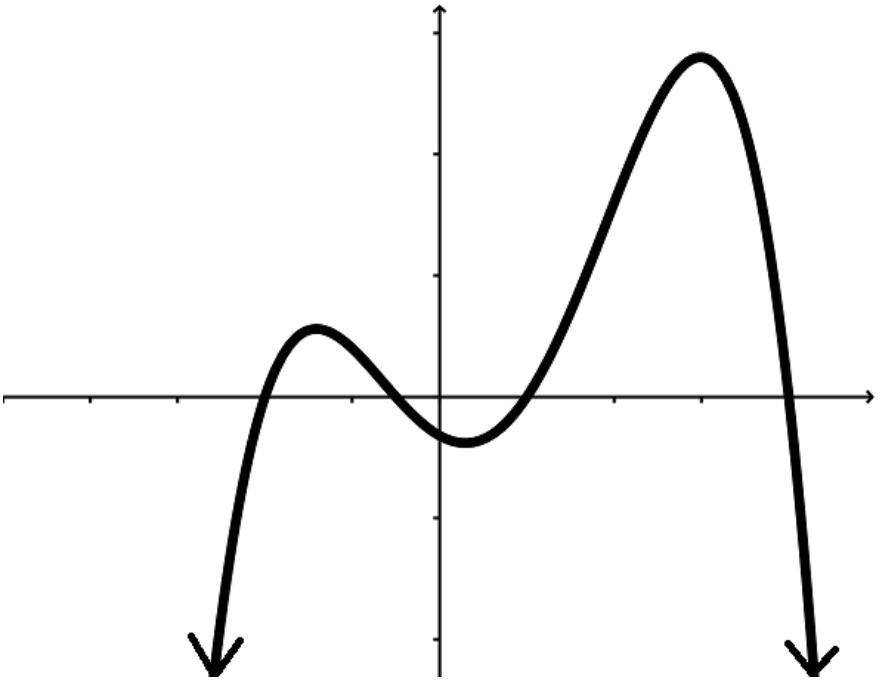
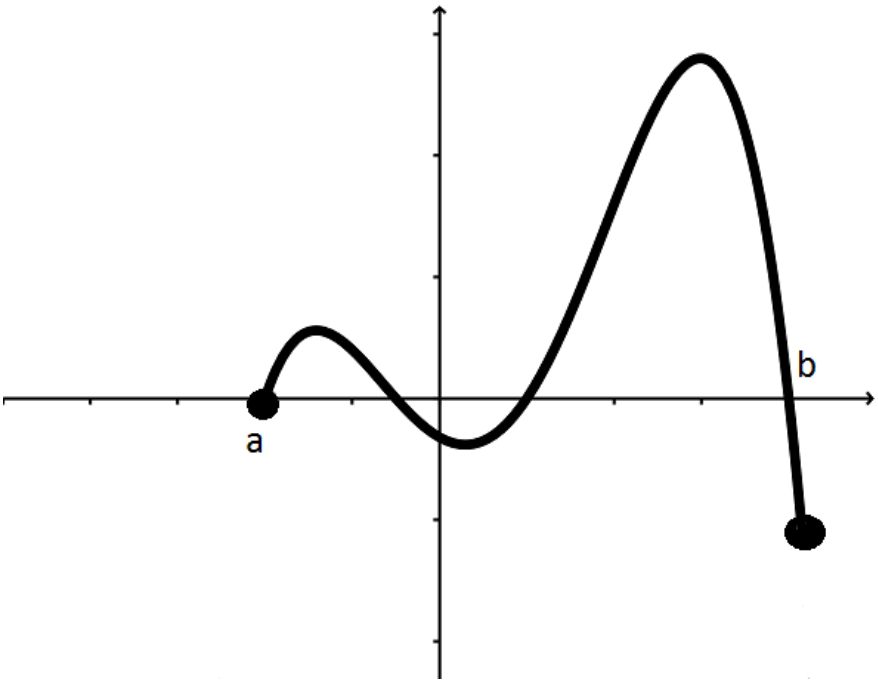


Extreme Value Theorem: If $f(x)$ is continuous on the closed, bounded interval $[a, b]$ then



How do we find the global maximum and minimum?

Conclusion: The global max (or min) of $f(x)$ on $[a, b]$ is either at

Ex: Find the global max and min of $f(x) = x^3 - 9x^2 + 15x + 6$ on the interval $[0,8]$.

Example 2: Find the global max and min of $f(x) = x^3 - 9x^2 + 15x + 6$ on the interval $[0,4]$.