

## Calculus 3.3 Key Points

### Derivative Notations:

	1st derivative	2nd derivative	3rd derivative	nth derivative
Lagrange:	$f'(x)$	$f''(x)$	$f'''(x)$	$f^{(n)}(x)$
Leibniz:	$\frac{dy}{dx}$	$\frac{d^2y}{dx^2}$	$\frac{d^3y}{dx^3}$	$\frac{d^ny}{dx^n}$

### Curve Analysis:

Global Minimum: The smallest y-value on an interval

Global Maximum: The largest y-value on an interval

1st Derivative Intervals	Slope		2nd Derivative Intervals	Concavity
$f'(x) > 0$	Positive		$f''(x) > 0$	Up
$f'(x) = 0$	Zero/flat		$f''(x) = 0$	Possible Inflection Point
$f'(x) < 0$	Negative		$f''(x) < 0$	Down

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Critical Points	1st derivative	2nd derivative	Concavity
Local Maximum:	$f'(x) = 0$	$f''(x) < 0$	Concave Down
Local Minimum:	$f'(x) = 0$	$f''(x) > 0$	Concave Up
Point of Inflection	$f'(x)$ can be positive or negative	$f''(x) = 0$	Point where concavity changes