BASIC DIFFERENTIATION RULES:

$f(x)$	$f'(x)$ or $\frac{df}{dx}$	**NAME**
x^n	nx^{n-1}	power rule
$[g(x)]^n$	$n[g(x)]^{n-1} \cdot g'(x)$	generalized power rule
$cg(x)$	$cg'(x)$	constant multiple rule
$g(x) + h(x)$	$g'(x) + h'(x)$	sum rule
$g(x) - h(x)$	$g'(x) - h'(x)$	difference rule
$g(x)h(x)$	$g'(x)h(x) + g(x)h'(x)$	product rule
$\frac{g(x)}{h(x)}$	$\frac{h(x)g'(x)-h'(x)g(x)}{[h(x)]^2}$	quotient rule
e^x	e^x	”e to the x” rule
b^x	$\ln b \cdot b^x$	exponential rule
$e^{g(x)}$	$e^{g(x)} \cdot g'(x)$	generalized exponential rule
$\ln x$	$\frac{1}{x}$	logarithmic rule
$\ln[g(x)]$	$\frac{g'(x)}{g(x)}$	generalized logarithmic rule

* All denominators assumed non-zero

FINDING MAXIMA & MINIMA

(1) Find critical points of $f(x)$:
   (a) Points where $f(x)$ is defined but $f'(x)$ is not
   (b) Stationary points (where $f'(x) = 0$)
(2) From (1)(b), set $f'(x) = 0$ and solve...these are *candidate* points
(3) Calculate $f''(x)$
(4) Evaluate $f''(x)$ at each candidate point from (2)
(5) Conclude:
   (a) If $f''(x) < 0$ then candidate gives a relative maximum
   (b) If $f''(x) > 0$ then candidate gives a relative minimum
   (c) If $f''(x) = 0$ then test $f'(x)$ on either side for character of point
(6) Compare points in (5) with those from (1)(a) to determine global extrema