Calculus 6.3 Key Points

Derivatives of Inverse Trigonometric Functions:

$f(x) = sin^{-1}(g(x)),$ $f'(x) = \frac{g'(x)}{\sqrt{1-g^2(x)}}$	$f(x) = cos^{-1}(g(x)), f'(x) = -\frac{g'(x)}{\sqrt{1-g^2(x)}}$
$f(x) = tan^{-1}(g(x)),$ $f'(x) = \frac{g'(x)}{1+g^2(x)}$	$f(x) = cot^{-1}(x), f'(x) = -\frac{g'(x)}{1+g^2(x)}$
$f(x) = sec^{-1}(g(x)),$ $f'(x) = \frac{g'(x)}{\lvert g(x)\rvert \bullet \sqrt{g^2(x)-1}}$	$f(x) = csc^{-1}(g(x)),$ $f'(x) = -\frac{g'(x)}{\lvert g(x)\rvert \bullet \sqrt{g^2(x)-1}}$

Derivatives of Logarithmic Functions:

$f(x) = log_a x, f'(x) = \frac{1}{x \bullet ln(a)}$ or $\frac{log_a(e)}{x}$

$f(x) = ln(x), f'(x) = \frac{1}{x}$

Derivatives of Inverse Functions:

If we have a function $f(x)$ where $f^{-1}(x) = g(x)$, then:

$g'(x) = \frac{1}{f'(g(x))}$

In other words, $[f^{-1}(x)]' = \frac{1}{f'(f^{-1}(x))}$