Calculus Textbook Pages 196 - 201

Curve Sketching: Analyzing a Graph

Ex) $f(x) = \frac{2(x^2-9)}{x^2-4} = 0$ $\quad f(0) = 9/2$ $\quad HA: \frac{2x^2}{x^2} = 2$

$f'(x) = \frac{20x}{(x^2-4)^2}$ $\qquad f''(x) = \frac{-20(3x^2+4)}{(x^2-4)^3}$

$0 = \frac{20x}{(x^2-4)^2}$ $\qquad 0 = \frac{-20(3x^2+4)}{(x^2-4)^3}$

- ★ x-intercepts: 3, -3
- ★ horiz asymp: 2
- ★ y-intercept: 9/2

★ Crit #'s = $-2, 2, 0$

	$(-\infty, -2)$	$(-2, 0)$	$(0, 2)$	$(2, \infty)$
	$f(x)$	$f'(x)$	$f''(x)$	characteristics
★ $(-\infty, -2)$		−	−	decreasing, concave down
★ $x = -2$	undef	undef	undef	vert asymp
$(-2, 0)$		−	+	decreasing, concave up
$x = 0$	9/2	0	+	relative minimum
$(0, 2)$		+	+	increasing, concave up
★ $x = 2$	undef	undef	undef	vert asymp
$(2, \infty)$		+	−	increasing, concave down