Section 3.6, #10

$$f(x)=\frac{x^2+1}{x^2-9}$$

$$f'(x)=\frac{2x(x^2-9)-2x(x^2+1)}{(x^2-9)^2}$$

$$f'(x)=\frac{2x^3-18x-2x^3-2x}{(x^2-9)^2}$$

$$f'(x)=\frac{-20x}{(x^2-9)^2}$$

$$0=-20x$$

$$0=x$$

$$f''(x)=\frac{-20(x^2-9)^2--20x(4x)(x^2-9)}{(x^2-9)^4}$$

$$f''(x)=\frac{(x^2-9)[-20(x^2-9)+20x(4x)]}{(x^2-9)^4}$$

$$f''(x)=\frac{-20(x^2-9)+20x(4x)}{(x^2-9)^3}$$

$$f''(x)=\frac{-20x^2+180+80x^2}{(x^2-9)^3}$$

$$f''(x)=\frac{60(x^2+3)}{(x^2-9)^3}$$

$$0=60(x^2+3)$$

$0=x^2+3$, this will have no real solutions.

Conclude that $x = 0$ is a critical point (first derivative equal to zero) with no inflection points (second derivative does not equal zero).