1. (2 pts) Find (and simplify) the second derivative of \( f(x) = \frac{x^2 + 4}{x^2 + 9} \).

(2 pts each) For #2–#9, find the relative extrema of the following functions. State each relative extrema as an ordered pair. Indicate your answer as a relative max or min. Pay close attention to the function’s domain.

2. \( f(x) = 3x^3 - 36x - 5 \)

3. \( f(x) = x^4 - 2x^3 \)
4. \[ f(x) = 3x^4 - 4x^3 - 24x^2 + 48x - 20 \]

5. \[ f(x) = \frac{x^2 + 8}{x + 1} \]
6. \[ f(x) = \frac{2x^2 - 15}{x^2 - 9} \]

7. \[ f(x) = 4x^2 \sqrt{x} + 5 \] (Careful with the domain.)
8. \[ f(x) = (2x - 3)e^{4x} \]

9. \[ f(x) = \ln(x^2 - 4x + 8) \] (Note: Domain = \( \mathbb{R} \))