KF

Math 101 (163)
Quiz 3 (4.1-4.5, 4.7)

Name: ID #: Section:

1. Find how many critical numbers does the following function have:
$$f(x) = \frac{x - \ln x}{x + 1}.$$
2. Find $\lim_{x \to 1^+} [\ln(x^6 - 1) - \ln(x^4 - 1)]$.
3. Let
$$f''(x) = x^{-\frac{4}{5}}(3 - x)^{-\frac{1}{3}}.$$
Find the intervals of concavity of f.
4. Find the point on the parabola $y = x^2$ that is closest to the point $(3,0)$.
5. Sketch a continuous function that satisfies all the following:
   a. $y = x - 2$ is a slant asymptote.
   b. $f'' > 0$ on $(-\infty, 1)$ and $f'' < 0$ on $(1, \infty)$.
   c. $x = 0$ is a critical number.