Exam 4

Name: _____

Each problem is worth 25 points. Show all your work for full credit; numerical or graphical estimates are unacceptable unless specifically requested.

1. Graph by hand:

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

Show all intercepts, asymptotes, intervals of increase/decrease, local extrema, intervals of concavity, and inflection points.

2. Find the limit:

(a) $\lim_{x\to 0^+} \frac{\tan x}{\sqrt{x}}$

(b) $\lim_{x\to\infty} \left(\frac{1}{x}\right)^{(1/\ln x)}$

(c) $\lim_{x\to\infty} \left[\sqrt{5x-3} - \sqrt{5x+4}\right]$

3. Find the largest proportion of an isosceles triangle that can be occupied by an inverted isosceles triangle contained inside of it.

4. Use Newton's method to approximate $\sqrt[3]{2}$ to the maximum accuracy supported by your calculator using only basic arithmetic.