EXAM 3 - MATH 112

DATE: Friday, March 17

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Read each problem very carefully before starting to solve it. Each question is worth 3 points. It is necessary to show your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

1. Find
   (a) the domain
   (b) the intercepts
   (c) the asymptotes
   (d) the intervals of monotonicity and the relative extrema
   (e) the intervals of concavity and the inflection points

   and, then roughly sketch the graph of the function $f(x) = \frac{x^2}{x^2-1}$.
2. Use a small table of 3 values to roughly sketch the graph of the functions
   (a) $f(x) = 5^x$
   (b) $g(x) = \log_{1/3} x$
3. What should be the interest rate in an account compounding continuously so that a deposit of \$2,000 now would yield \$10,000 in 10 years time?
4. Find the following derivatives:
   (a) $f(x) = \frac{e^{x^2}}{x-1}$
   (b) $y^2e^x + 2ye^{-x} = 2$
5. Find the following derivatives:
   (a) $f(x) = \ln \frac{\sqrt{4+x^2}}{x}$
   (b) $\ln(xy) + 5x = 30$
6. Find the equation of the tangent line to the graph of $f(x) = (e^{4x} - 2)^2$ at the point $(0, 1)$.