MAC 2233 FINAL EXAM AA Dr. Rapalje NAME _____

Show all work on separate paper. Turn in ALL worksheets.

1. Find an equation for a line (y=mx+b form) through the points (1, -2) and (3,4).

2. Find $\frac{f(x+h)-f(x)}{h}$ for $f(x)=2x^2-3x+1$.

3. $\lim_{x\to 1} \frac{x^2-x}{x^2-1}$

4. A company's cost function is $C(x)=20+3x+\frac{54}{\sqrt{x}}$ for $5\le x\le 20$.

   a) Find the company's marginal cost function.

   b) Find the company's marginal cost when x=9.

5. Find the second derivative of $f(x)=\frac{1}{2x^3}$.

6. Find the derivative of a) $h(z)=(3z^2-5z-1)^4$ b) $f(x)=\sqrt{x^2-5x-1}$.

7. Use calculus to find all relative maximum and minimum points for $f(x)=\frac{1-x}{x^2}$.

   Use the calculator draw the graph.

8. Find dy/dx for $x^2y^2-xy=2$ and evaluate at x = -1, y = 1.

9. Find how soon an investment at 7% interest compounded continuously will

   a) double in value; b) increase by 50%.

10. Find the derivative of a) $f(x)=\ln\sqrt{x^2+1}$ b) $f(x)=x\ln x-x$.

11. Find the derivative of a) $f(x)=2x^3-3xe^{2x}$ b) $f(x)=2x^3+3x\ln x-1$.

12a) $\int(\frac{1}{x^2}+\frac{1}{x}+e^{-x})\,dx$ 12b) $\int_1^9(x-\frac{1}{\sqrt{x}})\,dx$

13a) $\int x^3\sqrt{x^4-1}\,dx$ 13b) $\int \frac{dx}{x\ln x}$ Hint: Let **u** = **ln** ***x.***