

SUNY College at Oneonta
Math 173, Calculus I
The course of Dr. Mihailovs

Final Exam

December 18, 1998

Name _____

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Points											

1. Find $\lim_{x \rightarrow 2} \frac{x^2 - x - 2}{x^2 - 3x + 2}$.

2. Find $\lim_{x \rightarrow 2} \frac{x - \sqrt{x+2}}{x - \sqrt{3x-2}}$.

3. Find $\lim_{x \rightarrow \infty} \frac{x^2 - x - 2}{2x^2 - 3x + 2}$.

4. Use the Squeeze Theorem to find $\lim_{x \rightarrow \infty} \frac{\cos x}{x}$.

5. Find $f'(x)$ for $f(x) = 5x^3 + 4 \sin x + 3 \cos x + 2 \tan x + 1$.

6. Find an equation of the tangent to the curve $y = 5x^3 + 4 \sin x + 3 \cos x + 2 \tan x + 1$ at the point $(0, 4)$.

7. Find $f'(x)$ for $f(x) = \cos(x^3 + \sin 2x)$.

8. Find y' if $x^{2/3} + y^{2/3} = 1$.

9. Find the 100th derivative of $f(x) = x^{89} + 3 \sin x + 2 \cos x$.

10. Find an approximate value of $\sqrt[3]{997}$.

11. Find maximum and minimum values of $f(x) = \frac{x^2+5}{3x+2}$, $-4 \leq x \leq -1$.

12. Sketch the graph of $y = \frac{x^3}{1-x^2}$.

13. Find $\int \frac{(3x^2+2) dx}{\cos^2(x^3+2x+3)}$.

14. Find $f'(x)$ for $f(x) = (x - 3)^4 \cos 2x$.

15. Find $\int_0^3 (4(x - 3)^3 \cos 2x - 2(x - 3)^4 \sin 2x) dx$.

16. Find the area of the region bounded by the curves $y = \cos x$, $y = 1 - \cos x$ for $0 \leq x \leq 2\pi$.

17. Find the volume of the solid obtained by rotating the region under the graph of $y = \sqrt[4]{(x+2)/3}$ from $x = 1$ to $x = 10$ about the x -axis.

18. Find the volume of the solid obtained by rotating the region bounded by $y = 0$ and $y = 15(x - x^3)$, $x \geq 0$ about the y -axis.

19. Find the average value of the function $f(x) = \sin(x^7 + 2x^3 + 3x)$ over the interval $[-2\pi, 2\pi]$.