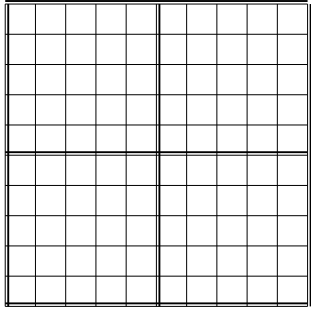


MATH 161 EXAM 3, FALL 2005

		Name:	Score
1.	Let $f(x) = x^3 - 12x + 4$ . Find: a) The critical values.         Ans: _____	b) The local extrema.         Ans: _____	1
			2
			3
			4
			5
			6
			7
			8
			9
2.	Sketch the graph of $y = x/(x^2 + 4)$ . Show everything (ie: Max, min, IP's, asymptotes)	<div style="text-align: right; margin-right: 50px;">  </div>	10
			Tot
3.	a) Use l'Hôpital's rule to find: $\lim_{x \rightarrow 1} \frac{x^8 - 1}{x - 1}$       Ans: _____	a) Use l'Hôpital's rule to find: $\lim_{x \rightarrow \infty} x^{1/x}$       Ans: _____	
4.	Sketch a graph of a function satisfying the given conditions: a) $f(2) = 3, f'(2) = 1, f''(2) = -2$	b) $f(3) = 2, f''(x) < 0$ for $x < 3$ ; $f''(x) > 0$ for $x > 3$ .	
5.	Find the absolute maximum of $f(x) = x^{2/3}(8 - x)$ in the interval $[0, 8]$ .         Ans: _____		

6. A box with a square base and no lid must have a volume of  $32 \text{ m}^3$ . Find the dimensions that will require the minimum amount of material.

Ans: \_\_\_\_\_.

7. Air is pumped into a spherical balloon at the rate of  $12 \text{ m}^3/\text{s}$ . How fast is the radius  $r$  increasing when  $r = 3 \text{ m}$ ?

Ans: \_\_\_\_\_.

8. The position of a particle in the interval  $[1, 4]$  is given by  $s(t) = 2t^2 - 4t + 1$ .

a) Find the average velocity in this interval.

b) Find a “ $c$ ” satisfying the MVT on  $I = [1, 4]$ .

Ans: \_\_\_\_\_.

Ans: \_\_\_\_\_.

9. Find the antiderivative  $f$ .

a)  $f'(x) = \frac{3x^2 - x + 2}{4x}$

b)  $f'(x) = 3 \sin x + 5 \sec x \tan x$ .

Ans: \_\_\_\_\_.

Ans: \_\_\_\_\_.

10. The acceleration of a particle is given by  $a(t) = -32$ , with  $v(0) = 8$  and  $s(0) = 24$ .

a) Find the velocity of the particle.

b) Find the position of the particle.

Ans: \_\_\_\_\_.

Ans: \_\_\_\_\_.

Extra space