

MATH 211 C
Prof. J. Beachy
No calculators!

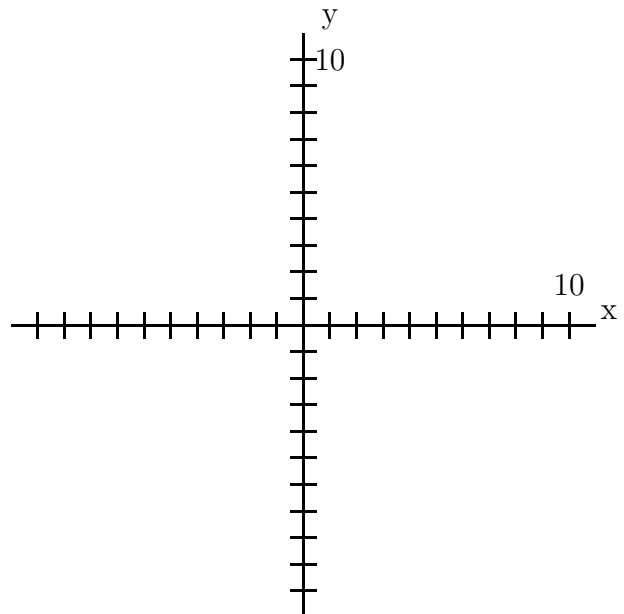
EXAM II
3/21/03

NAME _____
Circle recitation time: T 10:00 T 11:00 Th 10:00

1. (15 pts; 3.4 p246 #20) Find the absolute maximum and absolute minimum values of the function $f(x) = x^3 - 3x + 6$ on the interval $[-1, 3]$.

2. (15 pts; 3.5 p262 #21) Given the revenue function $R(x) = 50x - 0.5x^2$ and the cost function $C(x) = 4x + 10$, find the number x of units that must be produced in order to yield the maximum profit.

3. (25 pts; 3.3 p232 #27) Sketch the graph of the function $f(x) = x + \frac{9}{x} = \frac{x^2 + 9}{x}$. First find:
- Vertical and horizontal asymptotes, if any;
 - $f'(x)$ and $f''(x)$;
 - critical points; where $f(x)$ is increasing; where $f(x)$ is decreasing;
 - where $f(x)$ is concave up; where $f(x)$ is concave down;
 - the relative maximum and relative minimum points of the curve.



4. (20 pts; 3.5 p252 Ex3) A container firm is designing an open-top rectangular box, with a square base, that will hold 108 cubic centimeters. What dimensions yield the minimum surface area?

5. (10 pts; 2.9 p177 #47) Find $f''(x)$ for $f(x) = \frac{x}{x-1}$.

6. (15 pts; 3.2 p215 #25) The second derivative of the function $f(x) = \frac{x}{x^2+1}$ is

$f''(x) = \frac{2x^3 - 6x}{(x^2 + 1)^3}$. Use $f''(x)$ to find the intervals on which the graph of $f(x)$ is concave up and concave down.

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Total	/100
Grade	