Math 124I - Winter 2003
Mid-Term Exam Number Two
February 20, 2003

Name: _____ Section: _____

| | | |
|---|---|---|
| 1 | 20 | |
| 2 | 10 | |
| 3 | 10 | |
| 4 | 10 | |
| 5 | 10 | |
| 6 | 10 | |
| 7 | 10 | |
| Total | 80 | |

- Complete all questions.
- You may use a scientific (non-graphing) calculator during this examination. Other electronic devices are not allowed.
- You may use one hand-written 8.5 by 11 inch page of notes. You can use both sides of the note page.
- Show all work for full credit.
- You have 50 minutes to complete the exam.

.

1. Find $\dfrac{dy}{dx}$. You need not simplify your result.

(a) $y = \left(x^3 - 2x + \cos x\right)^8$

(b) $y = \dfrac{x^3 + 4}{x^2 - x + 1}$

(c) $y = \sec\left(x + e^x\right)$

(d) $y = x \sin 2x$

2. Find $\dfrac{dy}{dx}$. You need not simplify your result.

(a) $y = \ln \ln x$

(b) $x + \sin y = y + \cos x$.

3. Suppose $f(x) = (3 - 5x)^{-2}$. Find $f'''(0)$.

4. Find the equations of the tangent lines to the curve

$$y = \frac{\cos x}{1 + e^x}$$

at the point $\left(0, \frac{1}{2}\right)$.

5. Suppose $g(x) = \dfrac{xf(x)}{1+h(x)}$. Find $g'(2)$ given that:

$$f(2) = 1,\ f'(2) = 0,\ h(2) = -2,\ \text{ and } h'(2) = 3.$$

6. Find a parabola with equation $y = ax^2 + bx$ whose tangent line at $(2, 14)$ is $y = 17x - 20$.

7. Find the equation of the tangent line to $y = (\ln x)^2$ which passes through the origin.