Math 132 December 11, 2003

Exam 2

Name:_____ Section:_____

There are 100 possible points on this exam. Be sure to read each question carefully and answer the question asked. Show your work neatly and clearly– answers without justification will receive no credit. Partial credit may be given for a correct approach even if you don't get to the right answer. Give exact answers unless otherwise asked.

GOOD LUCK!

Problem	Max	Score
1	20	
2	20	
3	20	
4	20	
5	20	
TOTAL	100	

1. Simplify the following:

$a)\ 2^{-1}$ $b)\ 4^{\frac{3}{2}}$ $c)\ (16^{\frac{1}{2}})^2$ $d)\ \dfrac{1}{4^{\frac{1}{2}}}$

2. Suppose I am given an unfair six-sided die, where $P(1) = \frac{1}{2}$, $P(2) = \frac{1}{4}$ and $P(3) = P(4) = P(5) = P(6) = \frac{1}{16}$. If I roll this die twice, what is the probability that the product of the two rolls is four?

3. Determine the concavity of the following sets of points:

   (a) $(1, 4)$, $(-3, 2)$, $(-5, 7)$

   (b) $(0, 0)$, $(1, 2.2)$, $(3, 7.34)$

   (c) $(0, e)$, $(1, \pi + e)$, $(\pi, \pi^2 + e)$ (Here, e is a constant, $e > 0$)

4. Consider the piecewise equations

$$y_1 = \begin{cases} 2x + 4 & \text{if } x \leq -2 \\ 3 + 2(x - 3) & \text{if } x > -2 \end{cases}$$

and

$$y_2 = \begin{cases} 5 & \text{if } x \leq 100 \\ 2x - 195 & \text{if } x > 100 \end{cases}$$

(a) Is y_1 continuous? What about y_2?

(b) Find where $y_1 = y_2$

5. The least integer function $f(x) = \{x\}$ is defined

$$\{x\} = \text{smallest integer } N \text{ so that } x \leq N.$$

(a) Find $\{23.2\}$, $\{\pi\}$, $\{-\pi\}$ and $\{-14\}$.

(b) This function can be written as a piecewise function. Where are the "break points"? Explain.
(note: you do NOT have to give a formula for this function)