ÇANKAYA UNIVERSITY
Department of Mathematics and Computer Science

MATH 109
Math for Business

Final
Jan 10, 2007
11: 30 – 13: 30

Surname : _____
Name : _____
ID # : _____
Department : _____
Section : _____
Instructor : _____
Signature : _____

- The exam consists of 6 questions.
- Please read the questions carefully and write your answers under the corresponding questions. Be neat.
- Show all your work. Correct answers without sufficient explanation might not get full credit.
- Calculators are allowed. You can use only your own calculator.

GOOD LUCK!

Please do not write below this line.

Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
20	20	15	15	15	20	105

1. (20 pts.) Find the following limits

a) $\lim_{x \to 3^-} \dfrac{|x-3|}{|x|-3}$

b) $\lim_{x \to 2} \dfrac{x^2-3x+2}{\sqrt{x+2}-2}$

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2. (20 pts.) Find x so that

a) $\log_3 x + \log_3 (x-3) = \log_3 (10)$

b) $\log (3-x) + \log (1-x) + \log (2-x) = \log \left(x^2 - 3x + 2\right)$

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3. (15 pts.) Let

$$f(x) = \left(\frac{2x+4}{x+1}\right)^3$$

. Find $f'(1)$.

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4. (15 pts.) Find the equation of the tangent line to the curve $y = \dfrac{(x^2-3)^3}{\sqrt{4-3x}}$ at the point $(1, -8)$.

5. (15 pts.) If the average cost per unit, $\overline{C}$ of producing x units of a product is given by

$$\overline{C}(x) = \frac{4x}{x+2} + \frac{10000}{x},$$

then find the marginal cost when $x = 2$.

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6. (15 pts.) Your company makes remote control drone planes. The demand equation for these planes is

$$p = \frac{500}{5x + 20}$$

in millions of dollars, where p is the unit price and x is the number of units sold.

a) Find the revenue function in terms of x.

b) Find the marginal revenue.

c) Find $R'(10)$ and interpret the result.
