
KOÇ UNIVERSITY
MATH 101 - FINITE MATHEMATICS
Midterm I October 13, 2006

Duration of Exam: 60 minutes

INSTRUCTIONS: No calculators may be used on the test. No books, no notes, and talking allowed. You must always **explain your answers** and **show your work** to receive **full credit**. Use the back of these pages if necessary. **Print (use CAPITAL LETTERS) and sign your name, and indicate your section below.**

Surname, Name: _____

Signature: _____

Section (Check One):

- Section 1: S. Küçükçifci (11:00) _____
Section 2: M. Çağlar _____
Section 3: S. Küçükçifci (14:00) _____
Section 4: H. Oral (9:30) _____
Section 5: H. Oral (11:00) _____

PROBLEM	POINTS	SCORE
1	15	
2	28	
3	28	
4	29	
TOTAL	100	

1. (a) (7 points) Write an equation of the line passing through the points $(2, -5)$ and $(4, -2)$.

(b) (8 points) Let $f(x) = \frac{3}{2}x - 8$. What is the slope of the inverse function of $f(x)$?

2. Consider the function $f(x) = x^2 - 6x + 7$.

(a) (10 points) Find the vertex.

(b) (2 points) Find the line of symmetry (axis of symmetry).

(c) (8 points) Find x -intercept(s).

(d) (5 points) Sketch a graph of f .

(e) (3 points) Find the range of f .

3. Answer the following questions.

(a) (7 points) Solve the equation $2^{4x} = \frac{8^{x+5}}{2^x + 2^x}$ for x .

(b) (7 points) Simplify $e^{7x}(e^x - e^{-5x}) + (e^x - 2e^{-x})^2$.

(c) (8 points) Solve the equation $\log_b x - \log_b 5 = \log_b 2 - \log_b(x - 3)$ for x .

(d) (6 points) Let $\log_9 2 = M$. Find

(i) $\log_9 3$

(ii) $\log_9 6$

4. (a) (13 points) Sketch a graph the function $f(x) = \frac{6x}{2x - 5}$ for $-10 \leq x \leq 10$. Show at least 6 points on the graph.

(b) (2 points) Write the equation of the horizontal asymptote.

(c) (4 points) What are the domain and the range of f ?

Consider the following graph of a polynomial function $g(x) = a_n x^n + a_{n-1} x^{n-1} + \dots + a_1 x + a_0$ in parts d) and e)

(d) (5 points) What is the minimum degree n of a polynomial function that could have the above graph? Explain.

(e) (5 points) Is the coefficient a_n of the polynomial negative or positive? Explain.