ÇANKAYA UNIVERSITY

Department of Mathematics and Computer Science

MCS 115 - Mathematics for Architects

SECOND MIDTERM EXAMINATION
05.12.2014

STUDENT NUMBER:

NAME-SURNAME:

SIGNATURE:

INSTRUCTOR:

DURATION: 100 minutes

Question	Grade	Out of
1		20
2		30
3		30
4		30
Total		110

IMPORTANT NOTES:

1) Please make sure that you have written your student number and name above.

2) Check that the exam paper contains 4 problems.

3) Show all your work. No points will be given to correct answers without reasonable work.

1) Find the equation of the tangent line to the curve $f(x) = x^3 + 2x$ at the point $(1, 3)$.

2) Find $f'(x)$ if

a) $f(x) = (x+1)(x^2+2x)$

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

3) Find y' if

a) $y = \frac{1}{4} x\, e^{4x} - \frac{1}{16}\, e^{4x}$

b) $y = \ln \sqrt{x^2 + 3x + 1}$

4) Find $\dfrac{dy}{dx}$ if

a) $x^3 + 4xy - 3y^3 = 2x$

b) $e^{2y} = \ln x$

5) Evaluate the following limits.

a) $\lim_{x \to \infty} \dfrac{2x^3 + 1}{(6x^2 + 7)(5x + 2)}$

b) $\lim_{x \to 3} \dfrac{x^2 - 9}{|x - 3|}$

c) $\lim_{x \to 0} \dfrac{6x \cos x}{\sin 2x}$