November 16, 2012

IŞIK UNIVERSITY, MATH 101 MIDTERM EXAM-I

Exam Duration: 1 hr. and 45 min.	Q1		Q2		Row No:
Last Name:	First Name:				Student ID:

Q1. (10 pt) Graph the function $f(x) = -|x+2| + 1$ using the techniques of shifting and reflecting.

Q.2 Evaluate the following limits(Do not use the L'Hopital's Rule).

a. (6 pt) $\lim_{x \to 0^-} \frac{\sin |x|}{x}$

b. (6 pt) $\lim_{x \to 1} \frac{x-1}{\sqrt{x+3}-2}$

c. (6 pt) $\lim_{x \to 0} \frac{1-\cos x}{\sin 2x}$

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Exam Duration: 1 hr. and 45 min.	**Q3**		**Q4**		**Row No:**
Last Name:	**First Name:**			**Student ID:**	

Q3. Find the domain of the following functions:

a. (12 pt) $f(x) = \dfrac{\sqrt{x^2 - x - 6}}{x - 5}$

b. (6 pt) $f(x) = \sqrt[3]{3 + \sqrt{x}}$

Q4. Evaluate the followings:

a. (5 pt) $\tan\left(\cos^{-1}\dfrac{3}{5}\right)$

b. (5 pt) $\sin^{-1}\left(\sin\dfrac{3\pi}{4}\right)$.

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Exam Duration: 1 hr. and 45 min.	Q5		Q6		Q7		Row No:
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Q5. (8 pt) Find the inverse of the function $f(x) = \dfrac{5(1-e^{-2x})}{3}$.

Q6. (10 pt) Define $f(2)$ in a way that extends $f(x) = \dfrac{x^3-8}{x^2-4}$ to be continuous at every x.

Q7. (10 pt) Show that the equation $1000x^4 + 10x = 1$ has at least one solution.

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Exam Duration: 1 hr. and 45 min.	**Q8**		**Row No:**
Last Name:	**First Name:**		**Student ID:**

Q8. Suppose you are given the function

$$f(x) = \begin{cases} \dfrac{2x-4}{x^2-4} & \text{if } x < 2 \\ b & \text{if } x = 2 \\ \sqrt{ax^3 - \dfrac{3}{4}} & \text{if } x > 2. \end{cases}$$

where both a and b are constants.

a. (8 pt) Find the value of a so that $\lim_{x\to 2} f(x)$ exists.

b. (8 pt) Find the value of b so that the function $f(x)$ is continuous at $x = 2$.