25 points	25 points	25 points	25 points	100 points
1	2	3	4	**Total**

MATH 153 CALCULUS I 11.01.2013

İzmir University of Economics Faculty of Arts and Science Department of Mathematics

FINAL EXAM

Name: .....

Student No: .....

Department: .....

Section: Check for your instructor below:

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2. (a) Let

$$f(x) = \begin{cases} \dfrac{\ln(ex) - 1}{\sin(\pi x)} & , \text{ if } x \neq 1 \\ \dfrac{-1}{\pi} & , \text{ if } x = 1 \end{cases}$$

State whether f is continuous at $x = 1$.

(b) A spherical snowball melts at a rate proportional to its surface area. Show that the rate of change of the radius is constant. (Hint: Surface area= $4\pi r^2$)

4. (a) If $f(x) = 4x + x^3$, show that f has an inverse and find $(f^{-1})'(5)$.

(b) Sketch the graphs of $f(x) = x + 3$ and $g(x) = |2x|$ and find the area of the plane region bounded by these functions using integral.