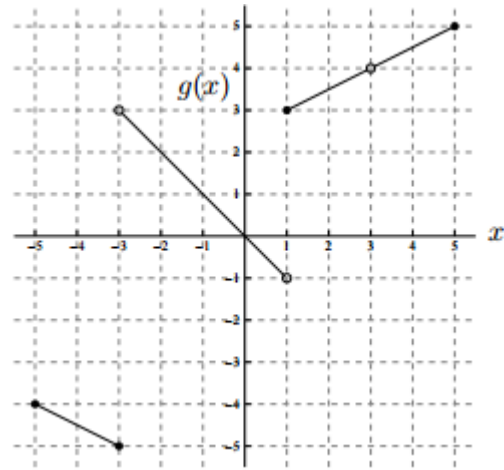# GROUPWORK III

1. Below is a table of values of an invertible function f(x) and the graph of a function g(x). Use these to answer the following questions.

x	0	1	2	3	4	5
$f(x)$	8	7	3	2	1.5	1

(a) Give one number in the interval [-5, 5] that is not in the domain of g.

(b) Give one number in the interval [-5, 5] that is not in the domain of g^{-1}.

(c) Evaluate f(f(5))

(d) Evaluate $g^{-1}(f^{-1}(1))$

(e) $\lim\limits_{x \to 3} g(x)$

(f) $\lim\limits_{x \to 1} g(x)$

(g) $\lim\limits_{x \to 1+} g(x)$

(h) $\displaystyle\lim_{x\to 1-} g(x)$

2. (a) Carefully state the Squeeze Theorem. (Include the case when x→∞.)

(b) $\displaystyle\lim_{x\to 0} x^4 \cos(2015/x)$

(e) $\displaystyle\lim_{x\to\infty} \frac{\cos^2(2015x)}{3-2x}$

3. Using our result for $\displaystyle\lim_{x\to 0} \frac{\sin x}{x}$ compute $\displaystyle\lim_{x\to 0} \frac{1-\cos x}{x}$

4. Using an appropriate table (for example, letting x = 0.1, 0.01, 0.001, etc.) determine (to the nearest tenth) the behavior of the function

$$f(x) = \frac{e^x - 1}{x}$$ as x approaches 0. (*Show your work!*)

x	f(x)
1	
0.1	
0.01	
0.001	
0.0001	
0.00001	
0.000005	

5. (b) Find $\displaystyle\lim_{x\to 2} \frac{x^4 - 3x - 3}{x-3}$

(b) Find $\displaystyle\lim_{x\to 2}\frac{x^5-32}{x-2}$

6. Suppose that $\displaystyle\lim_{x\to 2}\frac{f(x)-5}{x-2}=3.$ Find $\displaystyle\lim_{x\to 2}f(x)$