CS205- Summer 2012
Quiz 1 Name: _____

Show all work clearly and in order, and circle your final answers. Justify your answers algebraically whenever possible; when you do use your calculator, sketch all relevant graphs and write down all relevant mathematics. You have 15 minutes to take this 15 point quiz.

1. (*5 points*) (a) If A and B are two sets then $A \cap (A \cup B) =$ _____ (1 point)
(b-i) For each of the following sets, determine whether 3 is an element of that set (answer with Y or N in front of the 'dash').
(a) { 3, 3 } -
(b) { { { 3 } }, { 3 } } -
(c) { { {3 } } } -
(d) {3, { 3 } } -

(b-ii) For each of the above sets, determine whether { 3} is a subset of that set (answer Y or N). (a)-
(b)-
(c)-
(d)-

2. (*5 points*) (a) Consider the following mapping f over domain and co-domain { 1,2,3,4 }: $f(1) = 2; f(2) = 1; f(3) = 3; f(4) = 3$. (1+1+3 points)

Property	Yes/No	If no, a very brief example of why not
f is one-to-one		
f is onto		
$\mathbf{f} \circ \mathbf{f}$ is a bijection		

3. (*5 points*) For the series $3, \frac{3}{2}, \frac{3}{4}, \frac{3}{8}, \frac{3}{16}, \frac{3}{32} \ldots$. If $T(1) =$ the first term $= 3$, then, find expression for the i^{th} term $T(i)$ in the series (2 points). Also, using find the sum of the first n terms i.e. $S(n) = \sum_{i=1}^{n} T(i)$ using the formula for the sum of a geometric progression which is given by, $S(n) = \sum_{i=0}^{n} ar^i = \frac{a(1-r^{n+1})}{(1-r)}$ (3 points).