Calculus I; Professor Katiraie Quiz Three

Name:_____ Date:_____

1) $f(x)=\begin{cases} x^3+2; x\le -1 \\ x^2+x+1; -1<x<1 \\ x^4+2; x\ge 1 \end{cases}$ Find the following limits **(4 Points)**

a) $\lim_{x\to -1^-} f(x)$

b) $\lim_{x\to -1} f(x)$

c) $\lim_{x\to 1^+} f(x)$

d) $\lim_{x\to 1} f(x)$

2) Algebraically find the following limits. (please show all your work, you may verify your answer with your calculator, but for credit you must do this problem algebraically):

$\lim_{t\to 0} \frac{\sqrt{t+2}-3}{t-7}$ **(3 Pts)**

$\lim_{x\to -4} \frac{\frac{1}{4}+\frac{1}{x}}{4+x}$ **(3 Pts)**

3) Given $f(x)=\begin{cases}2x^3+16; x\le -2\\ x^2+bx+c; -2<x<2\\ 3x^4-48; x\ge 2\end{cases}$ **(3 Pts)**

Determine the values for b and c so that $f(x)$ is continuous everywhere.

4) Use the intermediate Value Theorem to show that there is a root for the equation $x^3+2x^2-42=0$ on the interval (0,3). **(3 Points)**

5) Algebraically find the following limit, if it exits. **(4 Points)**

$$\lim_{x\to\infty}\frac{-x-2+9x^2}{3x^2+4x+1}$$