LIMIT AND CONTINUITY

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Problems:

1. Give the meaning of $\lim_{x\to a} f(x) = l$

2. Give the definition of "f is continuous at a".

3. f(x)=$\begin{cases} x^2+2 & x<1 \\ \frac{1}{x+1} & x>1 \end{cases}$

   Write down (1) $\lim_{x\to 1^-} f(x)$ (2) $\lim_{x\to 1^+} f(x)$ (3) $\lim_{x\to 1} f(x)$

4. g(x)=$\begin{cases} x^3+1 & x<0 \\ 3 & x=0 \\ x+2 & x>0 \end{cases}$

   (i)Write down (1) $\lim_{x\to 0^-} g(x)$ (2) $\lim_{x\to 0^+} g(x)$ (3) $\lim_{x\to 0} g(x)$

   (ii)Is g continuous at 0 ? Why ?

5. h(x)=$\begin{cases} x^2+1 & x<-1 \\ 2 & x=\quad 1 \\ -2x & x>-1 \end{cases}$

   (i)Write down (1) $\lim_{x\to -1^-} h(x)$ (2) $\lim_{x\to -1^+} h(x)$ (3) $\lim_{x\to -1} h(x)$

   (ii)Is h continuous at -1 ? Why ?