

MA216

Suggested Problems (James Stewart 7th Edition)

Limits and Continuity (Problems Plus)

1. Evaluate $\lim_{x \rightarrow 1} \frac{\sqrt[3]{x} - 1}{\sqrt{x} - 1}$.
2. Find numbers a and b such that $\lim_{x \rightarrow 0} \frac{\sqrt{ax+b} - 2}{x} = 1$.
3. Evaluate $\lim_{x \rightarrow 0} \frac{|2x-1| - |2x+1|}{x}$.
4. Evaluate the following limits, if they exist, where $\llbracket x \rrbracket$ denotes the greatest integer function.
(a) $\lim_{x \rightarrow 0} \frac{\llbracket x \rrbracket}{x}$ (b) $\lim_{x \rightarrow 0} x \llbracket 1/x \rrbracket$
5. Find all values of a such that f is continuous on $\mathbb{R}$:
$$f(x) = \begin{cases} x+1 & \text{if } x \leq a \\ x^2 & \text{if } x > a \end{cases}$$
6. If $\lim_{x \rightarrow a} [f(x) + g(x)] = 2$ and $\lim_{x \rightarrow a} [f(x) - g(x)] = 1$, find $\lim_{x \rightarrow a} [f(x)g(x)]$.