

1 | Practice Problems

The relevant questions can be found here.

1. One should use a one-sided limit, more specifically a right-hand limit because \sqrt{x} is only defined for $x \geq 0$.

$$\lim_{x \rightarrow 0^+} \sqrt{x} = 0$$

2. One should use a one-sided limit because $\frac{1}{x+1}$ has an infinite discontinuity with asymptotes at $x = -1$. Either side will work. $\lim_{x \rightarrow 0^+} \frac{1}{x+1} = \infty$ $\lim_{x \rightarrow 0^-} \frac{1}{x+1} = -\infty$

3. One should use a two-sided limit because $\frac{1}{(x-1)^4}$ goes to infinity as x tends toward one from either side due to its even asymptote.

$$\lim_{x \rightarrow 1} \frac{1}{(x-1)^4} = \infty$$

4. One should use a two-sided limit because $|\sin(x)|$ is continuous. $\lim_{x \rightarrow 1} |\sin(x)| = 0$

5. One should use a one-sided limit as the function $\frac{|x|}{x}$ has a jump discontinuity at $x = 0$ and the left and right hand limits are not equal. Either side will work. $\lim_{x \rightarrow 0^+} \frac{|x|}{x} = 1$ $\lim_{x \rightarrow 0^-} \frac{|x|}{x} = -1$