

1. Use a calculator to estimate to 4 decimal digits:

$$\lim_{h \rightarrow 0} \frac{\sqrt{2+h} - \sqrt{2}}{h}$$

2. Determine

$$\lim_{x \rightarrow 3^+} \frac{1}{3-x} \quad \text{and} \quad \lim_{x \rightarrow 3^-} \frac{1}{3-x}.$$

A sketch of a graph might be helpful.

3. Sketch the graph of

$$f(x) = \frac{1}{(3-x)^2},$$

and use it to determine

$$\lim_{x \rightarrow 3} f(x).$$

4. Suppose

$$g(x) = \begin{cases} x^2 + 1 & x \geq -1 \\ 2 - x & x < -1. \end{cases}$$

Sketch the graph. Then determine if $\lim_{x \rightarrow -1} g(x)$ exists. If not, determine if the left- and right-hand limits exist. Give values for all of these limits that exist.

5. Use a calculator to estimate to 4 decimal digits:

$$\lim_{x \rightarrow 0} \frac{x^2}{\cos(x) - 1}$$

6. Determine exactly:

$$\lim_{x \rightarrow 2} \frac{x^2 - 7x + 10}{x - 2}$$