

1. Estimate

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

to 5 decimal digits.

2. Estimate

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

to 5 decimal digits.

3. Sketch the graph of

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

Then determine

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

4. Determine

$$\lim_{x \rightarrow 3^+} \frac{1}{3 - x}$$

and

$$\lim_{x \rightarrow 3^-} \frac{1}{3 - x}.$$

A sketch of the graph might be helpful.

5. Determine exactly

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

6. Determine if

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

exists. If not, determine if the left- and right-hand limits exist.

7. Determine the left- and right-hand limits at 0 of $f(x) = x/|x|$.

8. 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.

9. Determine

$$\lim_{x \rightarrow 0^+} 10^{-\frac{1}{x}}$$

and

$$\lim_{x \rightarrow 0^-} 10^{-\frac{1}{x}}.$$