1.8 Limits

Name: Date:

P 31. Let

$$f(x) = \begin{cases} x^2 - 2, & 0 < x < 3 \\ 2, & x = 3 \\ 2x + 1, & 3 < x \end{cases}.$$

Find

(a) $\lim_{x \to 3^+} f(x)$ (b) $\lim_{x \to 3^-} f(x)$ (c) $\lim_{x \to 3} f(x)$

P 35. Let

$$f(x) = \begin{cases} |x|/x, & x \neq 0 \\ 0, & x = 0 \end{cases}.$$

Is the function continuous for all x? If not, say where it is not continuous and explain in what way the definition of continuity is not satisfied.

P 63. Find the limit as $x \to \infty$ of
$$f(x) = \frac{2e^{-x} + 3}{3e^{-x} + 2}$$

P 69. Find a value of the constant k such that the limit exists.
$$\lim_{x \to \infty} \frac{x^3 - 6}{x^k + 3}$$

P 88. Give an example of a function $f(x)$ where $\lim\limits_{x\to\infty} f(x) = 2$ and $\lim\limits_{x\to-\infty} f(x) = -2$.