

Infinite Limits

In Exercises 9–28, find the vertical asymptotes (if any) of the function.

**Solution** 9.  $f(x) = \frac{1}{x^2}$

**Solution** 11.  $h(x) = \frac{x^2 - 2}{x^2 - x - 2}$

**Solution** 13.  $f(x) = \frac{x^2}{x^2 - 4}$

**Solution** 15.  $g(t) = \frac{t - 1}{t^2 + 1}$

**Solution** 17.  $f(x) = \tan 2x$

**Solution** 19.  $T(t) = 1 - \frac{4}{t^2}$

**Solution** 21.  $f(x) = \frac{x}{x^2 + x - 2}$

**Solution** 23.  $g(x) = \frac{x^3 + 1}{x + 1}$

**Solution** 25.  $f(x) = \frac{x^2 - 2x - 15}{x^3 - 5x^2 + x - 5}$

**Solution** 27.  $s(t) = \frac{t}{\sin t}$

10.  $f(x) = \frac{4}{(x - 2)^3}$

12.  $g(x) = \frac{2 + x}{x^2(1 - x)}$

14.  $f(x) = \frac{-4x}{x^2 + 4}$

16.  $h(s) = \frac{2s - 3}{s^2 - 25}$

18.  $f(x) = \sec \pi x$

20.  $g(x) = \frac{\frac{1}{2}x^3 - x^2 - 4x}{3x^2 - 6x - 24}$

22.  $f(x) = \frac{4x^2 + 4x - 24}{x^4 - 2x^3 - 9x^2 + 18x}$

24.  $h(x) = \frac{x^2 - 4}{x^3 + 2x^2 + x + 2}$

26.  $h(t) = \frac{t^2 - 2t}{t^4 - 16}$

28.  $g(\theta) = \frac{\tan \theta}{\theta}$

In Exercises 33–48, find the limit.

**Solution** 33.  $\lim_{x \rightarrow 2^+} \frac{x - 3}{x - 2}$

**Solution** 35.  $\lim_{x \rightarrow 3^+} \frac{x^2}{x^2 - 9}$

**Solution** 37.  $\lim_{x \rightarrow -3^-} \frac{x^2 + 2x - 3}{x^2 + x - 6}$

**Solution** 39.  $\lim_{x \rightarrow 1} \frac{x^2 - x}{(x^2 + 1)(x - 1)}$

**Solution** 41.  $\lim_{x \rightarrow 0^-} \left(1 + \frac{1}{x}\right)$

**Solution** 43.  $\lim_{x \rightarrow 0^+} \frac{2}{\sin x}$

**Solution** 45.  $\lim_{x \rightarrow \pi} \frac{\sqrt{x}}{\csc x}$

**Solution** 47.  $\lim_{x \rightarrow 1/2} x \sec \pi x$

34.  $\lim_{x \rightarrow 1^+} \frac{2 + x}{1 - x}$

36.  $\lim_{x \rightarrow 4^-} \frac{x^2}{x^2 + 16}$

38.  $\lim_{x \rightarrow (-1/2)^+} \frac{6x^2 + x - 1}{4x^2 - 4x - 3}$

40.  $\lim_{x \rightarrow 3} \frac{x - 2}{x^2}$

42.  $\lim_{x \rightarrow 0^-} \left(x^2 - \frac{1}{x}\right)$

44.  $\lim_{x \rightarrow (\pi/2)^+} \frac{-2}{\cos x}$

46.  $\lim_{x \rightarrow 0} \frac{x + 2}{\cot x}$

48.  $\lim_{x \rightarrow 1/2} x^2 \tan \pi x$