

Rational Functions

For each function, find [a] the x -intercept(s), [b] y -intercept, [c] vertical asymptote(s), and [d] non-vertical asymptote. Make a sketch of the function.

$$[1] f(x) = \frac{x+1}{x^2+4x}$$

$$[2] f(x) = \frac{x}{x^2+x-2}$$

$$[3] f(x) = \frac{x^2}{x^2+x-6}$$

$$[4] f(x) = \frac{x^2+x-12}{x^2-4}$$

$$[5] f(x) = \frac{x^3-1}{x^2-9}$$

$$[6] f(x) = \frac{x^3-2x^2-5x+6}{x^3-8x^2+16x}$$

$$[7] f(x) = \frac{x^2-4}{x+1}$$

$$[8] f(x) = \frac{x^2-1}{x+2}$$

$$[9] f(x) = \frac{x^3-x}{x^2-4}$$

Each of the following also has a removable discontinuity.

$$[10] f(x) = \frac{x+1}{x^2-1}$$

$$[11] f(x) = \frac{x-2}{x^2-4}$$

$$[12] f(x) = \frac{x^2+3x+2}{x^2-4}$$