

Rational Functions

Find the vertical asymptote, zeros, y-intercept, and holes of each function.

1.

$$f(x) = \frac{x-1}{x^2-4}$$

2.

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

3.

$$h(x) = \frac{3x^2-3x}{x^2+x-12}$$

4.

$$f(x) = \frac{x^2-4x+3}{x^2-x-6}$$

5.

$$k(x) = \frac{2x^3-5x^2+2x}{x^2-4}$$

6.

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

7.

$$f(x) = \frac{5}{x^2-2x-8}$$

8.

$$f(x) = \frac{x-1}{x^2+3x-4}$$

9.

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

10.

$$f(x) = \frac{1}{3x^2+3x-18}$$

11.

$$f(x) = \frac{x^2+x-6}{-4x^2-16x-12}$$

12.

$$f(x) = \frac{2x^2+10x+12}{x^2+3x+2}$$

Divide using either method. (Long Division or synthetic division)

13.

$$3x + 1 \overline{) 3x^3 - 5x^2 + 10x - 3}$$

14.

$$2x - 3 \overline{) 2x^4 - 9x^3 + 21x^2 - 26x + 12}$$

15.

$$x - 2 \overline{) 2x^4 - 1x^3 - 7x^2 - 3x + 10}$$

16.

$$2x + 3 \overline{) 2x^3 + 7x^2 + 2x + 9}$$