

## Preparation for Graphing Rational Functions

Date \_\_\_\_\_ Period \_\_\_\_\_

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**Identify the holes, vertical asymptotes, and horizontal asymptote of each.**

1)  $f(x) = \frac{x^2 - 1}{4x - 16}$

2)  $f(x) = \frac{x^2 + 4x + 3}{-4x - 8}$

3)  $f(x) = \frac{x^3 - 5x^2 + 4x}{3x^2 - 6x - 9}$

4)  $f(x) = \frac{x^2 - 16}{3x^2 + 12x}$

5)  $f(x) = \frac{x^3 - 2x^2 - 3x}{4x^2 - 20x + 24}$

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

7)  $f(x) = \frac{x + 1}{-x + 1}$

8)  $f(x) = \frac{2}{x^2 - 9}$

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

10)  $f(x) = \frac{-x - 1}{x - 3}$

$$11) f(x) = \frac{1}{x^2 - 9}$$

$$12) f(x) = \frac{x^2 - 7x + 12}{x^2 - x - 6}$$

$$13) f(x) = \frac{x - 1}{x + 2}$$

$$14) f(x) = \frac{x^2 + x - 12}{2x}$$

$$15) f(x) = \frac{-x^3 + 5x^2 - 4x}{x^3 - 7x^2 + 12x}$$

$$16) f(x) = \frac{3x - 12}{x^2 - 5x + 4}$$

$$17) f(x) = -\frac{4}{x^2 - 9}$$

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

$$19) f(x) = -\frac{1}{x + 4}$$

$$20) f(x) = \frac{x^3 - 2x^2 - 8x}{-4x^3 - 24x^2 - 32x}$$