

5.1 HW: Rational Graph Properties

Identify the requested information for each rational function.

1. $f(x) = \frac{-2x^2 + 32x}{x^2 - 9}$

Domain: $(-\infty, -3) \cup (-3, 3) \cup (3, \infty)$

Vertical Asymptotes:

$x = 3, x = -3$

Holes:

None

Horizontal Asymptotes:

$y = -2$

x-intercept(s):

$(0, 0) (16, 0)$

y-intercept:

$(0, 0)$

2. $f(x) = \frac{2x^2 + 10x + 8}{x^2 + 3x}$

Domain:

$(-\infty, -3) \cup (-3, 0) \cup (0, \infty)$

Vertical Asymptotes:

$x = 0, x = 3$

Holes:

None

Horizontal Asymptotes:

$y = 2$

x-intercept(s):

$(-1, 0) (-4, 0)$

y-intercept:

NO

3. $f(x) = \frac{x^3 + 2x^2 - 8x}{-4x^2 - 12x}$

Domain:

$$(-\infty, -3) \cup (-3, 0) \cup (0, \infty)$$

Vertical Asymptotes:

$$x = -3$$

Holes:

$$(0, -4/3)$$

Horizontal Asymptotes:

None

x-intercept(s):

$$(-4, 0) \quad (2, 0)$$

y-intercept:

None

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

Domain:

$$(-\infty, -1) \cup (-1, 3) \cup (3, \infty)$$

Vertical Asymptotes:

$$x = -1, x = 3$$

Holes:

None

Horizontal Asymptotes:

$$y = 0$$

x-intercept(s):

$$(4, 0)$$

y-intercept:

$$(0, 4/3)$$

5. $f(x) = \frac{x^2+4x+3}{2x^2-6x-8}$

Domain:

$$(-\infty, -1) \cup (-1, 4) \cup (4, \infty)$$

Vertical Asymptotes:

$$x = 4$$

Holes:

$$(-1, -1/5)$$

Horizontal Asymptotes:

$$y = 1/2$$

x-intercept(s):

$$(-3, 0)$$

y-intercept:

$$(0, -3/8)$$

6. $f(x) = \frac{2x+8}{x^2-x-6}$

Domain:

$$(-\infty, -2) \cup (-2, 3) \cup (3, \infty)$$

Vertical Asymptotes:

$$x = 3, x = -2$$

Holes:

None

Horizontal Asymptotes:

$$y = 0$$

x-intercept(s):

$$(-4, 0)$$

y-intercept:

$$(0, -4/3)$$