

Lessons 1.20 - 1.23 Practice

- Determine/state the excluded values and domain of the function
- Determine/state the location of any vertical, horizontal or slant asymptotes
- Determine/state the coordinates of any holes
- Determine/state the coordinates of any x intercepts

$$1. f(x) = \frac{3x+18}{x^2+3x-18} \quad \frac{3(x+6)}{(x+6)(x-3)}$$

EV: $x \neq -6, +3$

Domain: \mathbb{R} except $-6, +3$

VA: $x=3$

HA: $y=0$

SA: none

hole: $(-6, \frac{1}{2})$

x intercepts

$(3, 0)$

$$3. f(x) = \frac{(x+7)^2}{x^2-49} \quad \frac{(x+7)(x+7)}{(x+7)(x-7)}$$

EV: $x \neq 7, -7$

Domain: \mathbb{R} except $7, -7$

VA: $x=7$

HA: $y=1$

SA: none

hole: $(-7, 0)$

x intercepts: none

(it is a hole)

$$5. f(x) = \frac{x^2+12x+32}{x^2+7x-8} \quad \frac{(x+4)(x+8)}{(x+8)(x-1)}$$

EV: $x \neq -8, 1$

Domain: \mathbb{R} except $-8, 1$

VA: $x=1$

HA: $y=1$

SA: none

hole: $(-8, \frac{4}{9})$

$$7. f(x) = \frac{x^2+7x}{x^2+5x-14} \quad \frac{x(x+7)}{(x+7)(x-2)}$$

EV: $x \neq -7, 2$

Domain: \mathbb{R} except $-7, 2$

VA: $x=2$

HA: $y=1$

SA: none

hole $(-7, \frac{7}{9})$

x intercepts: $(0, 0)$

$$2. f(x) = \frac{x^2-25}{x^2+9x+20} \quad \frac{(x+5)(x-5)}{(x+5)(x+4)}$$

EV: $x \neq -5, -4$

Domain: \mathbb{R} except $-5, -4$

VA: $x=-4$

HA: $y=1$

SA: none

hole: $(-5, 0)$

x intercepts $(5, 0)$

$$4. f(x) = \frac{x^2-7x-18}{4x-8} \quad \frac{(x-9)(x+2)}{4(x-2)}$$

EV: $x \neq 2$

Domain: \mathbb{R} except 2

VA: $x=2$

SA: $y = \frac{1}{4}x - \frac{9}{4}$

HA: none

hole: none

x intercepts: $(9, 0), (-2, 0)$

$$6. f(x) = \frac{x^2+2x-15}{x^2-2x-15} \quad \frac{(x+5)(x-3)}{(x-5)(x+2)}$$

EV: $x \neq 5, -2$

Domain: \mathbb{R} except $5, -2$

VA: $x=5, x=-2$

HA: $y=1$

SA: none

hole: none

x intercepts $(-5, 0), (2, 0)$

$$8. f(x) = \frac{x^2-36}{x^2-3x-54} \quad \frac{(x+6)(x-6)}{(x-9)(x+6)}$$

EV: $x \neq 9, -6$

Domain: \mathbb{R} except ~~9, -6~~ $9, 6$

VA: $x=9$

HA: $y=1$

SA: none

hole: $(-6, \frac{4}{9})$

x intercepts: $(6, 0)$

Lessons 1.20 - 1.23 Practice

Solve each equation, do not include any extraneous solutions

$$10) \frac{5}{p+6} - \frac{1}{p^2+6p} = \frac{2}{p^2+6p}$$

$p(p+6) \quad p(p+6)$

$$5p - 1 = 2$$

$$5p = 3$$

$$p = \frac{3}{5}$$

$$12) \frac{5}{x+1} = \frac{6}{x^2-2x-3} + \frac{1}{x-3}$$

$(x-3)(x+1)$

$$5(x-3) = 6 + (x+1)$$

$$5x - 15 = 7 + x$$

$$4x = 22$$

$$x = \frac{11}{2}$$

$$14) \frac{k+1}{k} = 1 - \frac{k^2-3k-4}{4k}$$

$$k = 3$$

$$17) \frac{x^2-3x-4}{x^3-x^2} - \frac{1}{x^2} = \frac{x-2}{x^2}$$

$$x = -5$$

$$11) \frac{1}{2v} = \frac{5v+15}{v^2-6v} - \frac{v+6}{2v^2-12v}$$

$v(v-6) \quad 2v(v-6)$

$$v-6 = 2(5v+15) - (v+6)$$

$$v-6 = 10v+30 - v-6$$

$$v-6 = 9v+24$$

$$-30 = 8v$$

$$-\frac{15}{4} = v$$

$$13) \frac{n^2+7n+6}{n^2} = \frac{1}{6} - \frac{1}{6n^2}$$

$$n = -1, -\frac{37}{5}$$

$$15) 1 = \frac{2}{r^2} - \frac{1}{r}$$

$$r = 2, 1$$

$$18) 1 = \frac{n-2}{n-1} + \frac{3}{n^2+3n-4}$$

$(n+4)(n-1)$

$$n^2+3n-4 = (n-2)(n+4) + 3$$

$$n^2+3n-4 = n^2+2n-8+3$$

$\underbrace{-5}$

$$n = -1$$