

HWh: Section 2.6 Woksheet (Rational Functions)

Use the seven step process to graph the following rational functions.

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

a) symmetry = none
 b) y-int. = 4.5
 c) x-int. = x = -3, 3
 d) VA = x ≠ 2
 e) SA = $\frac{x+3}{x-2} = \frac{x+2}{x-2} + \frac{x+9}{x-2}$
y ≠ x+2

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

a) symmetry = none
 b) y-int. = 2
 c) x-int. = -4
 d) VA = x ≠ -2
 e) HA = y ≠ 1

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

a) symmetry = even
 b) y-int. = 0
 c) x-int. = 0
 d) VA = x ≠ -3, 3
 e) HA = y ≠ 1

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

a) symmetry = none
 b) y-int. = -2
 c) x-int. = none
 d) VA = x ≠ -1
 e) HA = y ≠ 0

5) $f(x) = \frac{2x^2 + x + 1}{x + 1}$

a) symmetry = none
 b) y-int. = 1
 c) x-int. = $\frac{-1 \pm \sqrt{1-4(2)}}{4}$
 $\frac{-1 \pm \sqrt{-7}}{4}$
none
 d) VA: x ≠ -1
 e) SA: $\frac{2x^2 + x + 1}{x + 1} = 2x - 1 + \frac{2}{x + 1}$
y ≠ 2x - 1

6) $f(x) = \frac{x+3}{x^2 - 9} = \frac{x+3}{(x+3)(x-3)} = \frac{1}{x-3}$

a) symmetry = none
 b) y-int. = -1/3
 c) x-int. = none
 d) VA = x ≠ 3
 e) HA = y ≠ 0

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

a) symmetry = none

b) y-int. = -1

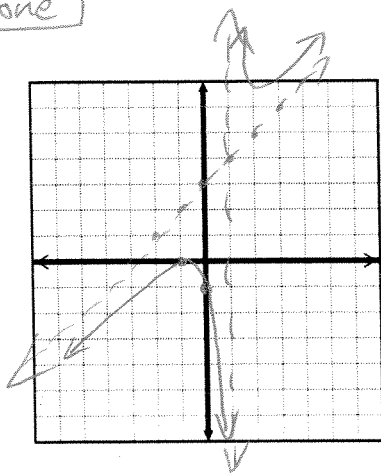
c) x-int. = -1

d) VA: $x \neq 1$

e) SA:

$$\begin{array}{r} 1 \ 1 \ 2 \ 1 \\ \ 1 \ 3 \\ \ 1 \ 3 \ \cancel{1} \end{array}$$

$$y \neq x + 3$$



$$8) f(x) = \frac{2x^2 + 3x - 2}{x^2 + x - 2} = \frac{(2x-1)(x+2)}{(x+2)(x-1)} = \frac{2x-1}{x-1}$$

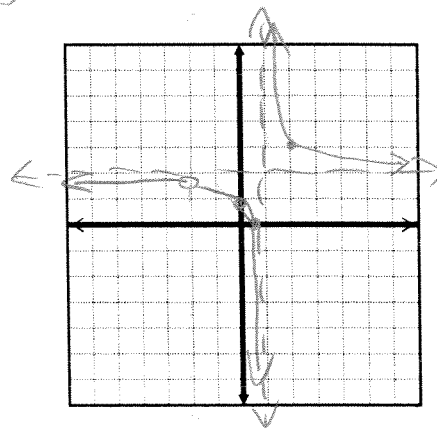
a) symmetry = none

b) y-int. = 1

c) x-int. = $\frac{1}{2}$

d) VA: $x \neq 1$

e) HA: $y \neq 2$



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

a) symmetry = none

b) y-int. = none

c) x-int. = 2, -2

d) VA: $x \neq 0$

e) SA:

$$\begin{array}{r} x+0 \\ x \) \ x^2 + 0x - 4 \\ \underline{x^2 + 0x} \\ + 0x - 4 \end{array}$$

$$y \neq x$$

