Section 3.5 Graphing Rational Functions

STEPS:

1) Write in factored form
2) State the domain
3) Simplify then find VAs
4) Find H.A. (or O.A)
5) Find x-ints (set simplified top = 0)
6) Find y-int (set $x=0$ in simplified form)
7) Complete a sketch. Used dashed lines for asymptotes. Label max and min points and the hole if there is one. (Use Desmos)

ex: $f(x) = \dfrac{x^2 - x - 12}{x+5}$

1) -12, -4, 3, -1 $\qquad \dfrac{(x-4)(x+3)}{x+5}$

2) $D = (-\infty, -5) \cup (-5, \infty)$

3) V.A. $x = -5$

4) deg of top = deg of bot
$\quad 2 \qquad\qquad 1$

OA: $y = x - 6$

O.A.
$$\begin{array}{r} x - 6 \\ x+5 \overline{\big) x^2 - x - 12} \\ x(x+5) \rightarrow \underline{-(x^2 + 5x)} \\ -6x - 12 \end{array}$$

5) x-ints: $(x-4)(x+3) = 0$
$x = 4, \; x = -3$

6) y-int: $\dfrac{(0-4)(0+3)}{0+5} = -\dfrac{12}{5} = y$

7)