Math 1410: Worksheet 7

October 8, 2021

Name: _____

1. Consider the rational function

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

   (a) What are the roots and asymptotes of $f(x)$, and their multiplicities? What is the degree of $f(x)$?

   (b) Create a sign diagram for $f(x)$, and use it to determine where $f(x) \geq 0$. (Give your answer in interval notation.)

   (c) Use your sign diagram to sketch a graph of $f(x)$.

2. Consider the rational function

$$r(x) = \frac{2x - 1}{x + 3}$$

(a) Rewrite $r(x)$ into the form $r(x) = Q + \frac{R}{x+3}$.

(b) Using this rewritten form, determine where the asymptotes of $r(x)$ are, and sketch a graph of it.