Math-19 Section 1

Homework #5

Due: 7/8/2019 9:00am

Reading

Sections 3.1–3.4,3.6–3.7

Problems

Consider the rational function:

$$y = \frac{2x^3 - 3x^2 - 3x + 2}{2x^3 + x^2 - 2x - 1}$$

1. Completely factor the numerator and the denominator and rewrite the function in simplified, factored form.
2. Do the long division and rewrite the function in quotient/remainder form.
3. Where are the zeros?
4. Where are the poles?
5. Where are the holes?
6. Where are the horizontal asymptotes?
7. Where are the vertical asymptotes?
8. Where is the y-intercept?
9. What is the end-behavior as $x \to \infty$? (be sure to specify above or below)
10. What is the end-behavior as $x \to -\infty$? (be sure to specify above or below)
11. Sketch the graph. All intercepts, asymptotes, and holes must be clearly marked.