

NAME: _____

HOMEWORK FOR WORKSHEET 9

MATH 1300

DUE March 14, 2008

1. Use the method from Worksheet 9 to find any non-vertical asymptotes for the function

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

and explain *how* you know that your answer is correct. (Hint: Look at parts (d) and (e) of Case 3 from the worksheet.)

In Worksheet 9 we did not consider the fourth possibility, that $f(x) = \frac{P(x)}{Q(x)}$ where the degree of $Q(x)$ is more than 1 less than the degree of $P(x)$. We examine this case in the next two exercises.

2. Use the same method as you did in answering problem 1 to find any *hidden* asymptotes for the function

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

3. Use the same reasoning as in problems 1 and 2 to find all asymptotes for the function

$$g(x) = \frac{-x^5 + x^2 - 8}{2x^2 - 1}.$$