MATH 1510 Tutorial Worksheet 2
September 20, 25, 2007

Question 1. Evaluate the following limits:

(a) $\displaystyle\lim_{x\to-\infty} \frac{3x^2 + 2x + 1}{4x^2 + 3}$

(b) $\displaystyle\lim_{x\to\infty} \frac{\sin(x+1)}{x-1}$

(c) $\displaystyle\lim_{x\to-\infty} \sqrt{x^2 + 2x} - \sqrt{x^2 - 2x}$

(d) $\displaystyle\lim_{x\to2} \ln\left(\frac{x^2-4}{x-2}\right)$

Question 2. The graph of $y = \dfrac{3x^2 + 2\sin(x)}{x+1}$ has an oblique asymptote. Find it.

Question 3. Consider the function

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

Find the x and y intercepts.
Find any horizontal asymptotes.
Find any vertical asymptotes (find the left and the right hand limits at these points).
Use this information to give a rough sketch of the graph of $y = f(x)$.