251 - Worksheet 2

Name:

Problem 1:

a) $\lim_{x\to\infty} \dfrac{x^2+1}{x^3+x+1}$

b) $\lim_{x\to\infty} \dfrac{4x^3+x^2+1}{7x^3+x^2+3}$

b) $\lim_{x\to\infty} \dfrac{x^4}{x^3+x^2+3}$

Problem 2: Find $\lim_{x\to-\infty} \sqrt{x^2+x} - \sqrt{x^2-x}$

Problem 3: Find $\lim_{x\to\infty} \dfrac{x+2\sin(x)}{1+x-5\sin(x)}$

Problem 4: Graph $f(x) = \frac{x-3}{x-1}$ and *then* determine $\lim_{x\to 1^-} f(x)$, $\lim_{x\to 1^+} f(x)$, $\lim_{x\to\infty} f(x)$ and $\lim_{x\to-\infty} f(x)$.

Problem 5: Come up with a function with the following properties: $f(1) = 1$, $\lim_{x\to 1^-} f(x) = 0$ and $\lim_{x\to 1^-} f(x) = 2$. Be sure to include an explicit definition of such a function.