Math 105, Fall 2013

Worksheet 10, Tuesday, November 19, 2013

1. Compute each of the following limits at infinity:

   (a) $\lim_{x\to\infty} \dfrac{x^2 - 3x + 2013}{x^2 + 5x - 1}$

   (b) $\lim_{x\to-\infty} \dfrac{9x^4 - 5x^2 + 7}{5x^4 + 6x - 3}$

   (c) $\lim_{x\to\infty} \dfrac{1 - x^3}{7x^3 + x^2 - 100}$

   (d) $\lim_{x\to\infty} \dfrac{x^4 + 3x^2 + 6}{x^3 + 7}$

   (e) $\lim_{x\to\infty} \dfrac{x^6 - x^3 + x}{x^7 + x^5 - 9}$

2. Let $f(x) = x^4 + 4x^3$. For this function, discuss domain, vertical and horizontal asymptote(s), interval(s) of increase or decrease, local extreme value(s), concavity, and inflection point(s). Then use this information to present a detailed and labelled sketch of the curve.

3. Let $f(x) = \dfrac{x}{x-3}$. For this function, discuss domain, vertical and horizontal asymptote(s), interval(s) of increase or decrease, local extreme value(s), concavity, and inflection point(s). Then use this information to present a detailed and labelled sketch of the curve.

4. Let $f(x) = \dfrac{1}{1-x^2}$. For this function, discuss domain, vertical and horizontal asymptote(s), interval(s) of increase or decrease, local extreme value(s), concavity, and inflection point(s). Then use this information to present a detailed and labelled sketch of the curve.

Turn in your own solutions.