1. (a) Based on your pre-class activity reflections, what should the definition of $\lim_{x\to\infty} f(x)$ "look like"?

   (b) And what about the definition of $\lim_{x\to-\infty} f(x)$?

   (c) What are the key elements of this definition?

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2. Compute the limits as x goes to infinity and negative infinity for the following functions:

   (a) $f(x) = \dfrac{2x^4 + 2x^2 - 3}{3x^4 + x^3 - 2x^2}$

   (b) $g(x) = \dfrac{2x^5 + 2x^2 - 3}{3x^4 + x^3 - 2x^2}$

   (c) $h(x) = \dfrac{2x^4 + 2x^2 - 3}{3x^6 + x^3 - 2x^2}$

   (d) $j(x) = \dfrac{\sqrt{2x^6 + 2x^2 - 3}}{3x^3 - 2x^2}$

3. Compute the horizontal asymptotes of the following functions:

   (a) $f(x) = \dfrac{\sqrt[3]{x} - 4x + 7}{3x + x^{2/3} - 1}$

   (b) $g(x) = \dfrac{1}{x}\sin x$ (compare your answer with $\lim\limits_{x\to\infty} \sin(\pi x)$ that you computed in the pre-class activity).

   (c) $f(x) = \dfrac{-x^2 + 5x - 1}{2x + 3}$

4. Compute the following limits:

   (a) $\lim_{x\to\infty}(x^2 - x)$

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

   (c) $\lim_{x\to\infty}(\sqrt{x^2+ax} - \sqrt{x^2+bx})$, where a and b are constants

   Based on what you have just computed, can you find a limit for which "$\infty - \infty$" gives 3? What about 10? What about any other number?

5. Determine the vertical and horizontal asymptotes of the following functions:

   (a) $f(x) = \dfrac{2x^2 + 1}{3x - 5}$

   (b) $f(x) = \dfrac{2x^2 + 5}{x^2 - 5x}$