Assignment 3 – All 2 parts – Math 241

Due in class: Tuesday, Jan. 30, 2018

These exercises are taken from the textbook (Hass, Weir, and Thomas' *University calculus alternate edition* or *UH Mānoa custom edition*).

Section 2.4: $38, 40, 42, 44$ and $46, 48, 50, 52, 58, 62$

Other problems: (Q1)–(Q4)

(Q1) Evaluate the following limits.

(a) $\lim_{x\to\infty} 1 + \dfrac{1}{\sqrt{x}}$

(b) $\lim_{x\to-\infty} \left(2 - \dfrac{1}{x}\right)^3$

(Q2) Determine the horizontal asymptotes for

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

(Q3) Determine the horizontal *and* vertical asymptotes for

$$g(x) = \begin{cases} x^2 & \text{if } x > 0 \\ 1/x^2 & \text{if } x < 0. \end{cases}$$

(Q4) Evaluate the following limits.

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

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

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

(d) $\lim_{x\to\infty} \left(\dfrac{2x^2 + 3x + 1}{x^2 + 5}\right)^3$