MATH 131: ASSIGNMENT 1

Manipulating functions

Book reference: Sections 0.1, 0.3, 0.6.

Complete the following problems from the book:

- Section 0.2, problems 17, 18, 19.
- Section 0.6, problems 23, 24, 25, 26, 27, 39, 40, 41.

Then complete the following:

Exercise 1.1. Consider the quadratic function $f(t) = -4(t-5)(t-7)$.

- Draw a sketch of the graph of $f(t)$
- What manipulations (shift, stretch, etc.) does done need to do to the 'standard' quadratic $f = t^2$ in order to obtain this function?

Exercise 1.2. Repeat the previous exercise for $f(t) = 8(t-2)(t+4)$.

Exercise 1.3. In this exercise you explore variations on the function $f(x) = \dfrac{1}{x^2}$.

(1) Draw a sketch of the graph of the function $f(x) = \dfrac{1}{x^2}$. Where is the vertical asymptote? Where is the horizontal asymptote?

(2) Draw a sketch of the shifted function $f(x) = \dfrac{1}{(x-4)^2}$. Where are the asymptotes?

(3) Draw a sketch of the function $f(x) = \dfrac{1}{x^2} - 4$. Where are the asymptotes?

(4) Draw a sketch of the function $\dfrac{5}{(x-3)^2} + 10$. Where are the asymptotes?