1.) Consider function \( f(x) = \frac{1}{x} + 3 \). Determine a function \( g(x) \) so that
   a.) \( f(g(x)) = x^3 + x^2 \)
   b.) \( f(g(x)) = 5f(x) \)
   c.) \( f(g(x)) = g(x) \)

2.) Write the volume of a cube as a function of its surface area. Use your result to find
the volume of a cube of surface area 24 square feet.

3.) Determine the domain and range for each function.
   a.) \( f(x) = \ln(x^2 - 4) \)
   b.) \( g(x) = \frac{e^x}{1000 + e^x} \)
   c.) \( h(x) = \frac{6}{3 - \sqrt{x^2 - 16}} \)
   d.) \( f(x) = \sqrt{\frac{(x - 1)(x - 2)}{(x + 3)(x + 2)}} \)

4.) Compute the following limits.
   a.) \( \lim_{x \to \frac{\pi}{4}} \tan x \)
   b.) \( \lim_{x \to \frac{\pi}{2}} \tan x \)
   c.) \( \lim_{x \to 8} \frac{x^{1/3} - 2}{x - 8} \)
   d.) \( \lim_{x \to 0^-} \sin(1/x) \)
   e.) \( \lim_{x \to -1} \frac{x^2 + 6x + 5}{x^3 + 1} \)
   f.) \( \lim_{x \to \infty} \frac{\sqrt{9x^2 + 16}}{x + 1} \)

5.) Use the Intermediate Value Theorem (IMVT) to verify that the following equation is
solvable. This is a writing exercise as well as a math exercise. Please be organized, clear,
and precise in your writing: \( x^3 = 10 + \sqrt{x} \)

6.) Determine the radius of the inscribed semi-circle.

7.) Plant 10 trees in 5 straight rows of four trees each.