Math 21A

Kouba

Discussion Sheet 2

- 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.

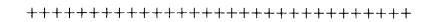
 - a.) $f(x) = \ln(x^2 4)$ b.) $g(x) = \frac{e^x}{1000 + e^x}$

 - 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.) $\lim_{x\to -\infty} \frac{\sqrt{9x^2+16}}{x+1}$

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- 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.



The following problem is for recreational purposes only.

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

