Math 1210-006 Assignment 1

Due September 3rd

1 Problem List

Chapter 0 section 4: 11, 13, 16
Chapter 0 section 5: 3, 7, 14, 21
Chapter 0 section 6: 5, 17
Chapter 0 section 7: 9, 13, 26
Chapter 1 section 1: 3, 4, 13, 14, 17, 18

2 Problems

2.1 Chapter 0 section 4

Plot the graph of each equation. Begin by checking for symmetries and be sure to find all x and y-intercepts.
11. $y = -x^2 - 2x - 2$
13. $x^2 - y^2 = 4$
16. $x^2 - 4x + 3y^2 = -2$

2.2 Chapter 0 section 5

3. For $G(y) = \frac{1}{(y-1)}$ find each value:
(a) $G(0)$
(b) $G(0.999)$
(c) $G(1.01)$
(d) $G(y^2)$
(e) $G(-x)$
(f) $G(\frac{1}{x^2})$

7. Which of the following determine a function f with formula y=f(x)? For those that do, find f(x). Hint solve for y in terms of x and recall that the definition of a function requires a single y-value for each x-value.
(a) $x^2 + y^2 = 1$
(b) $xy + y + x = 1$, $x \neq -1$
(c) $x = \sqrt{2y + 1}$
(d) $x = \frac{y}{y+1}$

14. Find the natural domain (implied domain) in each case:
(a) $f(x) = \frac{4-x^2}{x^2-x-6}$
(b) $G(y) = \sqrt{(y+1)^{-1}}$
(c) $\phi(u) = |2u+3|$
(d) $f(t) = t^{2/3} - 4$

21. Is the function $g(x) = \frac{x}{x^2-1}$ an even function, an odd function, or neither? Sketch its graph

2.3 Chapter 0, section 6

5. If $f(s) = \sqrt{s^2-4}$ and $g(w) = |1+w|$ find formulas for $(f \circ g)(x)$ and $(g \circ f)(x)$

17. Sketch the graph of $f(x) = (x-2)^2 - 4$ using translations

2.4 Chapter 0, section 7

9. Evaluate without using a calculator (or wolfram alpha)
(a) $\tan \frac{\pi}{6}$
(b) $\sec \pi$
(c) $\sec \frac{3\pi}{4}$
(d) $\csc \frac{\pi}{2}$
(e) $\cot \frac{\pi}{4}$
(f) $\tan\left(-\frac{\pi}{4}\right)$

13. Verify that the following are identities
(a) $\frac{\sin u}{\csc u} + \frac{\cos u}{\sec u} = 1$
(b) $(1-\cos^2 x)(1+\cot^2 x) = 1$
(c) $\sin t(\csc t - \sin t) = \cos^2 t$
(d) $\frac{1-\csc^2 t}{\csc^2 t} = \frac{-1}{\sec^2 t}$

26. Which of the following are odd functions, even functions or neither?
(a) $\cot t + \sin t$
(b) $\sin^3 t$
(c) $\sec t$
(d) $\sqrt{\sin^4 t}$
(e) $\cos(\sin t)$
(f) $x^2 + \sin x$

2.5 Chapter 1 section 1

3. Find the limit:

$$\lim_{x\to -2}(x^2+2x-1)$$

4. Find the limit:

$$\lim_{x\to -2}(x^2+2t-1)$$

13. Find the following limit, it may be useful to do some algebraic simplification first:

$$\lim_{t\to 2}\frac{\sqrt{(t+4)(t-2)^4}}{(3t-6)^2}$$

14. Find the following limit, it may be useful to do some algebraic simplification first:

$$\lim_{t\to 7^+}\frac{\sqrt{(t-7)^3}}{t-7}$$

17. Find the following limit, it may be useful to do some algebraic simplification first:

$$\lim_{h\to 0}\frac{(2+h)^2-4}{h}$$

18. Find the following limit, it may be useful to do some algebraic simplification first:

$$\lim_{h\to 0}\frac{(x+h)^2-x^2}{h}$$