

## CALCULUS 131: ASSIGNMENT 5

**Due Friday, November 3, in class. Worth a total of 75 points.**

Please answer the following questions:

Section 1.5: Problems 6, 8, 14, 20, 22 (*Hint: multiply and divide by  $\sqrt{x^2 + 2x} + x$* ) (4 points each).

Section 1.6: Problems 2, 4, 8, 12 (4 points each), 16 (6 points), 24, 30, 38, 52, 56 (4 points each).

**Problem A:** Let

$$f(x) = \begin{cases} 2x - 3 & \text{if } x < 1 \\ 5 & \text{if } x \geq 1, \end{cases}$$
$$g(x) = \begin{cases} x + 1 & \text{if } x < 1 \\ 2x & \text{if } x \geq 1, \end{cases}$$
$$h(x) = \begin{cases} x & \text{if } x < 0 \\ 4 & \text{if } x \geq 0. \end{cases}$$

- (1) Sketch the graphs of  $f$ ,  $g$  and  $h$ . (3 points)
- (2) At what points (if any) are  $f$ ,  $g$  and  $h$  discontinuous. (3 points)
- (3) Find a formula and sketch the graph of  $f + g$ . (3 points)
- (4) Find a formula and sketch the graph of  $f + h$  (*Hint: your answer will be a piecewise defined function involving the intervals  $(-\infty, 0)$ ,  $[0, 1)$  and  $[1, \infty)$* ). (4 points)

**Bonus Problem:** Section 1.6 Problem 70 (8 points).