MATH 251 (PHILLIPS): WRITTEN HOMEWORK 6 PART 2

This homework sheet is due in class on Wednesday 26 February 2025 (week 8), in class. Write answers on a separate piece of 8.5 by 11 inch paper, well organized and well labelled, with each solution starting on the left margin of the page. Or, print a copy of this page and write on it.

5 points per problem, total 20 points.

In each problem, either draw the graph of a function satisfying the stated conditions, or explain why no such function can exist. Show scales on the axes. In all parts, the function is supposed to be defined and differentiable on the interval $(0, 8)$.

1. $g'(x) \leq 0$ for all x in $(0, 8)$, $g(2) = 1$, and $g(7) = 3$.

2. $f'(x) < 0$ on $(0, 2)$, $f'(2) = 0$, $f'(x) > 0$ on $(2, 6)$, $f'(6) = 0$, $f'(x) < 0$ on $(6, 8)$, $f(2) = 1$, and $f(6) = 4$.

3. $k'(x) < 0$ on $(0, 4)$, $k'(4) = 0$, $k'(x) > 0$ on $(4, 8)$, and k has a local maximum at $x = 4$.

4. $l''(x) < 0$ on $(0, 3)$, $l''(x) > 0$ on $(3, 8)$, $l'(3) = -\frac{1}{2}$, and $l(3) = 0$.
(If you print this page, put the answer on the back.)

Date: 26 February 2025.