Math S165 **Due January 21**

Homework S2

1. Do problems 2, 3, 4, 7, 9, 10, and 12 on page 191 of the text.

2. Do problems 8, 12, 14, 17, and 21 on pages 194 and 195 of the text.

3. We proved (Theorem 4.7, page 187) that if f is differentiable on an interval and $f'(x) > 0$ for every x in the interval, then f is strictly increasing on the interval.

(a) **Prove:** If f is differentiable on the interval (a, b) and $f'(x) \geq 0$ for all x with $a < x < b$ and $f'(x) = 0$ for at most one value of x in (a, b), then f is strictly increasing in the interval (a, b).

(b) What if there are exactly two points in the interval (a, b) for which $f'(x) = 0$? (That is, either prove the same result as in part (a), or find an example with $f'(x) = 0$ exactly two times for which f is not strictly increasing on (a, b).)