

## Homework 14

Math 262

Write your solutions to the following problems and turn them in to the homework mailbox (RMS level 3, near the fireplace) by 5:00pm on **Monday, May 8**.

### Book Problems

- Section 4.3 #57, 62, 63, 64 (pages 330–336)
- Section 4.4 #68, 69, 73, 76, 77, 79 (pages 347–351)

*Hint:* For #68, recall that  $f_X(x) = 10kx^2 + 0.05$ , for  $20 \leq x \leq 30$ , where  $k = \frac{3}{380,000}$ . By symmetry of  $X$  and  $Y$ ,  $f_Y(y)$  is similar.

### Additional Problem

Suppose that  $X$  is the random variable denoting the number of bacteria per cubic centimeter in water samples and that for a given location,  $X$  has a Poisson distribution with mean  $\lambda$ . But  $\lambda$  varies from location to location and has a gamma distribution with parameters  $\alpha$  and  $\beta$ . Find expressions for  $E(X)$  and  $V(X)$  in terms of  $\alpha$  and  $\beta$ .