

Homework 10

Math 262

Write your solutions to the following problems and turn them in to the homework mailbox (RMS level 3, near the fireplace) by 4:00pm on **Friday, November 1**.

Book Problems

- Section 3.2 #19, 23, 33, 36 (pages 168–171)
- Section 3.3 #39abcj, 40abe, 47, 55 (pages 182–187)

Note: While you should know the normal pdf, you will likely want to use technology to evaluate the probabilities for these problems. In your solutions, please write the function call, such as `pnorm(x, μ , σ)` or `qnorm(x, μ , σ)`, that you used to get your answer.

Additional Problems

1. Suppose X is a random variable with pdf

$$f(x) = \begin{cases} ax + bx^2, & 0 \leq x \leq 1 \\ 0, & \text{otherwise} \end{cases}$$

and $E(X) = \frac{1}{9}$. Either find a and b , or explain why this is not possible.

2. Let $Z \sim N(0, 1)$ and $X \sim N(\mu, \sigma)$. Find $E(Z^3)$, the third moment of Z . Then find $E(X^3)$, the third moment of X .

Hint: Don't do this by computing antiderivatives, unless you love messy integration. Instead, use a fact about integrals of functions with odd symmetry. Also use the fact that $X = \sigma Z + \mu$ and expand the cube inside of the expected value.