

MTH 372

Hw 5

Read Chapters 10,11 of *Huber*.

p.70, #10.2 Say that $P(R = 0) = 0.3$, $P(R = 2) = 0.45$, and $P(R = 3) = 0.25$.
What is $E[R]$?

#10.4 Suppose $p_W(w) = \begin{cases} 1/10 & \text{if } w \in \{1, 2, 3, 4\} \\ 2/10 & \text{if } w \in \{5, 6, 7\} \end{cases}$.
What is $E[W]$?

#10.6 Let $E[X] = 2$. What is $E[15 - 5X]$?

p.76 #11.2 Let $X \sim \text{Unif}([3, 6])$. Find $E[X]$.

#11.8 Suppose $Y = 1/U$ where $U \sim \text{Unif}([0, 1])$. Show that $E[Y]$ does not exist.

#11.10 Let $U \sim \text{Unif}([0, 1])$. Find the expected value of $W = \sqrt{U}$.

11.14 For a random variable A , the mean absolute deviation of A is defined as

$$\text{MAD}(A) = E[|A - E[A]|].$$

For $U \sim \text{Unif}([0, 1])$, find $\text{MAD}(U)$.

11.16 Two birds are flying with speed (independently of each other) uniform between 21.1 and 32.3 mph. What is the expected speed of the faster bird?

#11.20 A random variable X has the Beta distribution with parameters a and b if it has density $f_X(s) = s^{a-1}(1-s)^{b-1}$ ($s \in [0, 1]$).

- (a) For X Beta with parameters 3 and 1, find $E[X]$.
- (b) Find $E[3X + 6]$.
- (c) Find $E[X^2]$.