

MATH 241 Chapter 4 part 1 Live Exercises

- Two fair six-sided dice are rolled. Let the random variable X denote the product of the 2 dice. What are possible values of X and their associated probabilities? Just give a few examples and you do not need to calculate the associated probability for all possible values.
- Two fair six-sided dice are rolled. Let the random variable X denote the product of the 2 dice. Find the probability of: (a) $P(X \leq 2)$, (b) $P(X \leq 35)$.
- Three fair coins are tossed. Let the random variable X denote the number of heads. Write out the pmf and cdf of X .
- Suppose that the distribution function of X is given by

$$F(b) = \begin{cases} 0, & b < 0 \\ \frac{b}{4}, & 0 \leq b < 1 \\ \frac{1}{2} + \frac{b-1}{4}, & 1 \leq b < 2 \\ \frac{11}{12}, & 2 \leq b < 3 \\ 1, & 3 \leq b \end{cases}$$

Find $P(X = i), i = 1, 2, 3$.

- Toss a coin. Suppose the probability of a head is p . Let X be a 0-1 indicator random variable s.t.

$$X = \begin{cases} 1 & \text{if head is obtained} \\ 0 & \text{otherwise} \end{cases}$$

Compute $\mu = E[X]$.

- Let the random variable X denote the GP a certain student will earn in this class. Suppose its pmf is

$$p(0) = 0.05, \quad p(1) = 0.05, \quad p(2) = 0.3, \quad p(3) = 0.4$$

Calculate their expected GP $E[X]$.

- Let X denote a random variable that takes on any of the values -1, 0, and 2 with respective probability: $P(X = -1) = \frac{1}{5}, P(X = 0) = \frac{1}{5}, P(X = 2) = \frac{3}{5}$. Compute $E[X^3]$.
- Let X denote a random variable that takes on any of the values -1, 0, and 2 with respective probability: $P(X = -1) = \frac{1}{5}, P(X = 0) = \frac{1}{5}, P(X = 2) = \frac{3}{5}$. Compute:
 - $E[2X^2]$
 - $E[4X^2 - 1]$