Exercise sheet 4

Probability and Statistics, MTH102

1. If a pair of dice are rolled. Let X denote the sum of the values on the dice. Compute $E[X]$.

2. A pair of dice are rolled. Every time at least one of the dice shows up a 6, a person gets 10 points, and every time at least one of the dice shows up a 1, a person 2 points are deducted. For anything else, there is no change in the points. Represent this as a random variable X and compute $E[X]$.

3. Let X denote the the difference between the number of heads and tails when tossing a coin n times. What are the possible values that the random variable X can take? If $n = 4$, what is the probability mass function?

4. If X is a random variable that can take the values $-1, 0$, or 1. Let $P(X = -1) = 1/7$, $P(X = 0) = 2/7$, and $P(X = 1) = 4/7$. Let Y denote the random variable so that $Y = X^2$. Compute $E[Y]$.

5. A biased coin with probability of head appearing being p is tossed n times. Let X denote the number of times a head appeared. Assume $E[X^2] = \sum x_i^2 p(x_i)$ and compute $E[X^2]$