

Department of Mathematics, Bennett University
EMAT203L (Probability and Statistics)
Tutorial sheet sheet 2

1. Consider a random variable X taking values 1, 2, 5, 7 with probabilities $\frac{1}{6}$, $\frac{1}{4}$, $\frac{1}{4}$, $\frac{1}{3}$, respectively.
- (a) Find $P(X \in \{2, 5\})$.
- (b) Find mean and variance of random variable X .

2. Consider a random variable X with following PMF:

x_i	-2	-1	0	1	2	3
p_i	.1	k	.2	$2k$.3	k

Find value of k , and mean and variance of random variable X .

3. Consider a continuous random variable with following PDF: $f_X(x) = \frac{2}{51}x$, $7 \leq x \leq 10$.
- (a) Find probabilities $P(7.5 \leq X \leq 8.3)$, $P(X \leq 9.2)$, $P(X = 8.58)$, $P(X \geq 8)$, $P(X > 8)$ and $P(X \leq 8)$.
- (b) Find mean and variance of random variable X .
4. A random variable X has following PDF $f_X(x) = 3x^2$, $0 \leq x \leq 1$.
- (a) Find $P(X \geq .7)$.
- (b) Find mean and variance of random variable X .
- (c) Find a and b such that $P(X \leq a) = P(X > a)$.
- (d) Find b such that $P(X > b) = 0.35$.
5. Let X and Y be two independent random variables with means as -2 and 3, and variances as 4 and 7, respectively.
- (a) Find standard deviation of X and Y .
- (b) Find mean and variance of $2X$ and $-3X$.
- (c) Find mean and variance of $X + 7$ and $-3X + 5$.
- (d) Find mean and variance of $2X + 3Y + 7$ and $-3X + 5Y$.
6. A fair coin is tossed 10 times. What is the probability of getting exactly 4 heads?