

Probability I – 2009/10

Numerical Solutions to End-Semester Test

Q1.(ii) $\frac{17}{30}$

Q2.

(i)

x	0	1	2
$P(X = x)$	$1/4$	$1/4$	$1/2$

(ii) $\mathbb{E}(X) = \frac{5}{4}$

(iii) $\text{Var}(X) = \frac{11}{16}$

Q3.

(ii)

x	0	1	2	3
$P(X = x)$	$8/27$	$12/27$	$6/27$	$1/27$

(iii)

$$F_X(x) = \begin{cases} 0 & \text{if } x < 0 \\ 8/27 & \text{if } 0 \leq x < 1 \\ 20/27 & \text{if } 1 \leq x < 2 \\ 26/27 & \text{if } 2 \leq x < 3 \\ 1 & \text{if } 3 \leq x \end{cases}$$

Q4.

(i)

$$f_X(x) = \begin{cases} 0 & \text{if } x \leq 0 \\ 3x^2 & \text{if } 0 \leq x < 1 \\ 0 & \text{if } 1 < x \end{cases}$$

(ii) $\mathbb{E}(X) = 3/4$

(iii) $\text{Var}(X) = 3/80$