

SAMPLE PAPER 2014 (SET F): PAPER 2

QUESTION 2 (25 MARKS)

QUESTION 2 (a)

X	$P(X)$	$XP(X)$
1	0.25	0.25
2	0.25	0.50
3	0.15	0.45
4	0.15	0.60
5	0.1	0.50
6	0.1	0.60
		$\sum XP(X) = 2.9$

$$E(X) = \sum XP(X)$$

Multiply the probability of obtaining each number ($P(X)$) by the number (X) to get $XP(X)$. Then sum all the individual $XP(X)$'s.

Expected value $E(X) = 2.9$ (biased die)

QUESTION 2 (b)

X	$P(X)$	$XP(X)$
1	$\frac{1}{6}$	$\frac{1}{6}$
2	$\frac{1}{6}$	$\frac{2}{6}$
3	$\frac{1}{6}$	$\frac{3}{6}$
4	$\frac{1}{6}$	$\frac{4}{6}$
5	$\frac{1}{6}$	$\frac{5}{6}$
6	$\frac{1}{6}$	1
		$\sum XP(X) = \frac{21}{6} = 3.5$

With a fair die the probability of obtaining each number is one-sixth.

Expected value $E(X) = 3.5$ (fair die)

It cost €3 to play a game at the funfair. You win the number of euro shown on the die. With the biased die you expect to win €2.90. However, given that you paid €3 to play the game, your net loss will be 10 cent.

With the fair die you expect to win €3.50. However, given that you paid €3 to play the game, your net win will be 50 cent.

“If you play the game many times with a fair die, you will win an average of **50 c** per game, but if you play with the biased die you will lose an average of **10 c** per game.”
