

Probability distribution

x can be any outcome

$P(X = x)$ is the probability for that outcome

Sum of all the probabilities equals to 1

1.

x	0	1	2	3	4
$P(X = x)$	0.1	0.2	0.4	k	0.1

Find the value of k .

2.

x	0	1	2	3	4
$P(X = x)$	0.04	0.19	0.42	0.02	k

Find the value of k .

Expectation

$$E(x) = np$$

n is the number of trials


p is the probability of occurring in each of trials

1. A basketball player has probability 0.72 of making a free throw.
How many free throw would he expect to make form 120 attempts?

2. If a dice is rolled 230 times, how many times of number 1 faces
down would be expected?

Exercise


Paper 1

1.  A bag contains black and white chips. Rose pays \$10 to play a game where she draws a chip from the bag. The following table gives the probability of choosing each colour chip.

Outcome	Black	White
Probability	0.4	0.6

Rose gets no money if she draws a white chip, and gets \$ k if she draws a black chip.

The game is fair. Find the value of k .


2.  A discrete random variable X has the following probability distribution.

x	0	1	2	3
$P(X = x)$	$\frac{3}{10}$	$\frac{4}{10}$	$\frac{2}{10}$	p

(a) Find p .

(b) Find $E(X)$.

Paper 2

1.  A test has five questions. To pass the test, at least three of the questions must be answered correctly.

The probability that Mark answers a question correctly is $\frac{1}{5}$. Let X be the number of questions that Mark answers correctly.

(a) (i) Find $E(X)$.

(ii) Find the probability that Mark passes the test.

Bill also takes the test. Let Y be the number of questions that Bill answers correctly.

The following table is the probability distribution for Y .

y	0	1	2	3	4	5
$P(Y = y)$	0.67	0.05	$a + 2b$	$a - b$	$2a + b$	0.04

(b) (i) Show that $4a + 2b = 0.24$.

(ii) Given that $E(Y) = 1$, find a and b .

(c) Find which student is more likely to pass the test.
