

Probability

STUDENT NAME: KA BARIKAA	TOTAL MARKS OBTAINED
CLASS: 12 B	SUBJECT: Maths
ROLL NO.: 2	DATE: 11.11.25

SECTION A

- 1) ~~a~~ c, The outcomes must be continuous
- 2) c, $\in \text{Ex: pi}$
- 3) d, $np(1-p)^2$
- 4) c, $\sqrt{3}$
- 5) ~~a~~ b, is equal to the mean.
- 6) a, Both A & R are true and R is the correct explanation of A
- 7) b, Both A & R are true but R is not the correct explanation of R

SECTION B

- 8) $n=3$,
let n be number of heads obtained.

x	1	2	3
$P(x)$	ak	$2k$	$2k$

a)

X	0	1	2	3
$P(X)$	$0.2k$	$0.3k$	$0.4k$	$0.1k$

$\frac{0.1k}{0.3}$
WORKING

NOTE

$$\underline{0.2}$$

$$\underline{0.3}$$

$$\underline{0.4}$$

$$\underline{0.1}$$

$$\underline{1.0}$$

$$\underline{0.4 \times 2}$$

$$\underline{2.8}$$

~~$$23+28$$~~

~~$$69+$$~~

~~$$16 \times 4$$~~

~~$$51$$~~

$$0.2k + 0.3k + 0.4k + 0.1k = 1$$

$$1k = 1$$

$$k = 1$$

$$E(Y) = 0 + 1(0.3k) + 2(0.4k) + 3(0.1k)$$

$$= 0 + 0.3 + 2.8 + 0.3 = 3.4$$

10) probability of girl = $0.5 P(x)$

$$n = 6$$

probability that 4 are girls = ?

let no. of girls be n $P(n=4)$ ~~$P(x) =$~~

n	0	1	2	3	4	5	6
$P(n)$							

$\frac{0.5}{0.5} \times \frac{0.5}{0.5} \times \frac{0.5}{0.5} \times \frac{0.5}{0.5} \times \frac{0.5}{0.5} \times \frac{0.5}{0.5}$

$$\frac{1}{64}$$
11) let no. of accidents be n

n	0	1	2	3	4	5
$P(n)$	$2k$	$2k$	$2k$	$2k$	$2k$	$2k$

$$\frac{43}{10}$$

$$\frac{43}{10} \times \frac{43}{10}$$

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 $P(n=3)$

$$\frac{3}{2k}$$

$$P(n) = 2k$$

$$= 2 \times 0.7 = \frac{14}{10} = 1.4$$

$$= 0.2$$

$$\frac{0.23 \times 0.23}{69}$$

$$\frac{0.23 \times 0.23}{69} \times \frac{0.23}{69}$$

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(2) mean = 170 $\sigma = 8$ $n = 182$

~~$$\frac{(x - \bar{x})^2}{n}$$~~

SECTION C

(3)

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

$$P(x) = 0.1 + k + 2k + k + 0.2 = 1$$

$$= 4.3k = 1$$

$$k = \frac{10}{4-3}$$

a)

$$k = 0.23$$

b)

$$P(n \geq 2)$$

$$P(x) = \frac{2}{2k} + \frac{3}{k} + \frac{4}{0.2}$$

$$= \frac{2}{2(0.23)} + \frac{3}{0.23} + \frac{4}{0.2}$$

$$= \frac{2k + 6k}{2k^2} + \frac{4}{0.2}$$

$$= \frac{4.8k}{2k^2} + \frac{4}{0.2}$$

$$= \frac{4k}{k^2} + \frac{4}{0.2}$$

$$= \frac{4.8k + 4k^2}{0.2k^2}$$

$$= \frac{(4.8 \times 0.23) + 4(0.23)(0.23)}{0.2 \cdot 0.23 \cdot 0.23}$$

$$\begin{aligned}
 P(n) &= 2k + k + 0.7 \\
 &= 2(0.23) + (0.23) + 0.2 \\
 &= 2.46 + 0.23 + 0.2 \\
 &= 2.89
 \end{aligned}$$

$$\begin{aligned}
 c) E(x) &= 0(0.1) + 1(1e) + (2k)2 + 3(k) + 4(0.2) \\
 &= 0 + k + 4k + 3k + 4.8 \\
 &= 8k + 4.8 \\
 &= 8 \times 0.23 + 4.8 \\
 &= 1.84 + 4.8 \\
 &= 6.64
 \end{aligned}$$

(4) Total = 10 questions
each = 4 answers

a) This probability distribution is random distribution, since Student answers each question by guessing randomly.

$$b) P(n = 7)$$

$$\begin{array}{r}
 0.99 \\
 \times 0.0002 \\
 \hline
 0.056 \\
 + 0.944 \\
 \hline
 0.944
 \end{array}$$

$$\text{c) at least one correct answer} = 1 - (0.75)^{10} \\ = 1 - 0.0563 \\ = 0.944$$

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(6) mean = 40 mins
 $\mu = 5 \text{ mins}$

a) $P(\bar{x} > 35)$

b) P Between 30 - 35 mins.

(7)
a) Sample error