9th Math Review Exercise 13

Q. 1 Choose the correct option.

i. Each element of the sample space is called:
(a) Event
(b) Experiment
(c) Sample point
(d) Outcomes

ii. An outcome which represents how many times we expect the things to be happened is called:
(a) Outcomes
(b) Favourable outcomes
(c) Sample space
(d) Sample point

iii. Which one tells us how often a specific event occurs relative to the total number of frequency event or trials?
(a) Expected frequency
(b) Sum of relative frequency
(c) Relative frequency
(d) Frequency

iv. Estimated probability of an event occurring is also known as:
(a) Relative frequency
(b) Expected frequency
(c) Class boundaries
(d) Sum of expected frequency

v. The sum of all expected frequencies is equal to the fixed number of:
(a) Trials
(b) Relative frequencies
(c) Outcomes
(d) Events

vi. The chance of occurrence of a particular event is called:
(a) Sample space
(b) Estimated probability
(c) Probability
(d) Expected frequency

vii. An event which will probably occur. It has greater chance to occur is called:
(a) Equally likely event

(b) Likely event
(c) Unlikely event
(d) Certain event

viii. Find out the total number of possible sample space when 4 dice are rolled:
(a) 6^2
(b) 6^3
(c) 6^4
(d) 6^6

ix. While rolling a pair of dice, what will be the probability of double 2 ?
(a) $\frac{1}{6}$
(b) $\frac{1}{3}$
(c) $\frac{5}{6}$
(d) $\frac{1}{36}$

x. A card is chosen from a pack of 52 playing cards, find the probability of getting no jack and king.
(a) $\frac{2}{3}$
(b) $\frac{11}{13}$
(c) $\frac{2}{52}$
(d) $\frac{11}{52}$

Answers Key

i	c	ii	b	iii	c	iv	a	v	a
vi	c	vii	b	viii	c	ix	d	x	b

Multiple Choice Questions (Additional)

1. The word probability is derived from:
   (a) English word
   (c) French word

(b) Latin word
(d) Greek word

2. Who is known as the father of probability?
   (a) Girolamo Cardano
   (b) Sir Ronald Fisher
   (c) George Cantor
   (d) John Venn
3. The process which generate the result is called:
   (a) Event
   (c) out comes
   (b) Experiment
4. The set of all possible outcomes is
   (d) probability called:
   (a) Event
   (c) Sample space
   (b) Experiment
   (d) probability
5. The probability of a certain Event is:
   (a) 0
   (b) 1
   (c) 2
   (d) not possible
6. The probability of an impossible event is:
   (a) 0
   (b) 1
   (c) 2
   (d) -1
7. The probability of an equally likely event is:

   (a) 0
   (b) 1
   (c) 50
   (d) 0.5

8. What is range of probability?

(a) $0 \leq P(A) < 1$
(b) $0 < P(A) \leq 1$
(c) $0 \leq P(A) \leq 1$
(d) $0 \leq P(A) \geq 1$

9. If Hadi rolled a fair dice then the probability of getting a prime number is:
(a) 0.5
(b) 1
(c) 0
(d) 0.6
10. If Fatima rolled two fair dice then the probability of getting a fractional number is
(a) 0.5
(b) 1
(c) 0
(d) 2
11. The sum of the probability of an event and its complement must be:
(a) 0.5
(b) 1
(c) 0
(d) 2
12. If the probability of an event is $\frac{3}{7}$, then what is the probability of not occurring that event?
(a) $\frac{6}{14}$
(b) $\frac{7}{3}$
(c) 0
(d) $\frac{4}{7}$

13.The sum of all relative frequencies is always equal to:
(a) 0
(b) 1
(c) 1.5
(d) 2
14.If $n(S) = 12$ and $n(B) = 8$ then $P(B)$ is:
(a) $\frac{3}{2}$
(b) $\frac{2}{3}$
(c) 20
(d) 4

15. If $n(S) = 18$ and $n(E') = 4$ then $P(E')$ is:

(a) $\frac{4}{18}$

(b) $\frac{2}{9}$

(c) $\frac{7}{9}$

(d) $\frac{18}{4}$

Answer Key

1	**b**	**2**	**a**	**3**	**b**	**4**	**c**	**5**	**b**	**6**	**a**	7	**d**	8	**c**	9	**a**	10	**c**
11	**b**	**12**	**d**	**13**	**b**	**14**	**b**	**15**	**b**										

Q. 2 Define the following:

(i) Relative frequency

(ii) Expected frequency

(i) Solution:

Relative frequency tells us how often a specific event occurs relative to the total number of frequency events or trails. It is calculated by using the following method.

Relative frequency

$$= \frac{\text{Frequency of specific event}}{\text{Total frequency}}$$

$= \frac{x}{\mathrm{N}}$, where $\mathrm{N} = \Sigma f$

(ii) Expected Frequency is a measure that estimates how often an event should occur depending on probability. Expected frequency is found by using the following method:

Expected = Total number of trails $\times$

Probability of the event.

$$= N \times P(A)$$

Q. 3 An urn contains 10 red balls, 5 green balls and 8 blue balls. Find the probability of selecting at random.

(i) a green ball

(ii) a red ball

(iii) a blue ball

(iv) not a red ball

(v) not a green ball
Solution
Red balls $= 10, \mathrm{n(R)} = 10$

Green balls $= 5, \mathrm{n(G)} = 5$
Blue balls $= 8, \mathrm{n(B)} = 8$
Total balls $= 10 + 5 + 8 = 23,$

$$n(S) = 23$$

(i) Probability of selecting green ball:

$$P(G) = \frac{n(G)}{n(S)} = \frac{5}{23}$$

(ii) Probability of selecting red ball:

$$\mathrm{P(R)} = \frac{\mathrm{n(R)}}{\mathrm{n(\ S)}} = \frac{10}{23}$$

(iii)Probability of selecting blue ball:

$$P(B) = \frac{n(B)}{n(S)} = \frac{8}{23}$$

(iv) Probability of selecting not red ball:

$$\begin{aligned} P(R') &= 1 - \frac{10}{23} \\ &= \frac{23 - 10}{23} \\ &= \frac{13}{23} \end{aligned}$$

(v) Probability of selecting not a green ball:

$$P(G') = 1 - P(G)$$
$$P(G') = 1 - \frac{5}{23}$$
$$P(G') = \frac{23 - 5}{23}$$
$$P(G') = \frac{18}{23}$$

Q. 4 Three coins are tossed together. What is the probability of getting.
(i) exactly three heads
(ii) at least two tails
(iii) not at least two heads
(iv) not exactly two heads
Solution:
When two coins are tossed together, their all-possible outcomes are given below.

$$\begin{aligned} S = \{&(HHH),(HHT),(HTH),(THH)\\ &(TTT),(TTH),(THT),(HTT)\} \end{aligned}$$

$$n(S) = 8$$

(i) Exactly three heads

Solution:
(i) Exactly three heads:

$$A = \{HHH)\}, n(A) = 1$$

Probability of getting exactly three heads:

$$P(A) = \frac{n(A)}{n(S)} = \frac{1}{8}$$

(ii) At least two tails

Solution:
Let "B" an event of at least two tails. $B = \{(TTT),(TTH),(THT),(HTT)\}$

$$n(B) = 4$$

Probability of getting at least two tails

$$P(B) = \frac{n(B)}{n(S)} = \frac{4}{8} = \frac{1}{2}$$

(iii) not at least two heads
Solution
Let "C" be event of at least two heads

$$n(C) = 4$$

$$C = \{(H,H,H),(H,H,T),(H,T,H),T,H,H)\}$$

Probability of at least two heads.

$$P(C) = \frac{n(C)}{n(S)} = \frac{4}{8} = \frac{1}{2}$$

Probability of getting at least not two heads

$$P(C') = 1 - P(C)$$
$$= 1 - \frac{1}{2} = \frac{2-1}{2} = \frac{1}{2}$$

(iv) Not exactly two heads

Solution:
Let "D" be an event of exactly two heads $D = \{(HHT),(HTH),(THH),n(D) = 3$
Probability of getting exactly two heads.

$$P(D) = \frac{n(D)}{n(S)} = \frac{3}{8}$$

Probability of getting not exactly two heads

$$P(D') = 1 - P(D)$$
$$= 1 - \frac{1}{8} = \frac{8-3}{8} = \frac{5}{8}$$

Q. 5 A card is drawn from a well shuffled pack of 52 playing cards. What will be the probability of getting:
(i) King or Jack of red colour
Solution
Total cards $= 52, n(S) = 52$
Let A be an event of getting King or jack of red colour.
Number of king or jack red cards, $n(A) = 4$
Probability of event A,

$$P(A) = \frac{n(A)}{n(S)} = \frac{4}{52} = \frac{1}{13}$$

(ii) Not " 2 " of club and spade Let " B " be an event of getting " 2 " of club and spade cards.

Number of " 2 " of club and spade cards. $n(B) = 2$
Probability of event B,

$$P(B) = \frac{n(B)}{n(S)} = \frac{2}{52} = \frac{1}{26}$$

Probability of getting not " 2 " of club and spade cards,

$$P(B') = 1 - P(B)$$
$$\Rightarrow = 1 - \frac{1}{26}$$
$$= \frac{26 - 1}{26}$$
$$= \frac{25}{26}$$

Q. 6 Six coins are tossed 600 times. The number of occurrence of tails are recorded and shown in the table given below.

No. of tails	0	1	2	3	4	5	6
Frequency	110	90	105	80	76	23	16

Find the relative frequency of given table. Solution

No. of fails	f	Relative frequency
0	110	$\frac{110}{600} = \frac{11}{60}$
1	90	$\frac{90}{600} = \frac{3}{20}$
2	105	$\frac{105}{600} = \frac{7}{40}$
3	80	$\frac{80}{600} = \frac{2}{15}$

4	76	$\frac{76}{600}=\frac{19}{150}$
5	123	$\frac{123}{600}=\frac{41}{200}$
6	16	$\frac{16}{600}=\frac{2}{75}$
	Σf $=600$	

Q. 7 From a lot containing 25 items, 8 items are defective. Find the relative frequency of non-defective items, also find the expected frequency of nondetective items.

Solution:

Total number of items $=25$

Number of defective items $=8$

Number of non-defective items $=25-8=17$

Relative frequency of non-defective items

$=\frac{17}{25}=0.68$

Expected frequency of non-defective items $=N\times$ R.f. of non-defective items.

$=25\times\frac{17}{25}$

$=25\times\frac{17}{25}$

$=17$