



MATHS

BOOKS - SURA MATHS (TAMIL ENGLISH)

STATISTICS AND PROBABILITY

Exercise 8 1

1. Find the range and coefficient of range of the following data.

(i) 63,89,98,125,79,108,117,68

(ii) 43.5,13.6,18.9,38.4,61.4,29.8



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2. If the range and the smallest value of a set of data are 36.8 and 13.4 respectively, then find the largest value.

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3. Calculate the range of the following data.

Income	400- 450	450- 500	500- 550	550- 600	600- 650
Number of workers	8	12	30	21	6

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4. A teacher asked the students to complete 60 pages of a record note book. Eight students have completed only 32,35,37,30,33,36,35 and 37 pages. Find the standard deviation of the pages yet to be completed by them.

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5. Find the variance and standard deviation of the wages of 9 workers given below :

Rs. 310, Rs. 290, Rs. 320, Rs 280, Rs. 300, Rs. 290, Rs. 320, Rs. 310, Rs. 280.



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6. A wall clock strikes the bell once at 1 o' clock, 2 times at 2 o' clock, 3 times at 3 o' clock and so on. How many times will it strike in a particular day. Find the standard deviation of the number of strikes the bell make a day.



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7. Find the standard deviation of first 21 natural numbers.



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8. If the standard deviation of a data is 4.5 and if each value of the data is decreased by 5, then find the new standard deviation.

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9. If the standard deviation of a data is 3.6 and each value of the data is divided by 3, then find the new variance and new standard deviation.

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10. The rainfall recorded in various places of five districts in a week are given below.

Rainfall (in mm)	45	50	55	60	65	70
Number of places	5	13	4	9	5	4

Find its standard deviation.

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11. In a study about viral fever, the number of people affected in a town were noted as

Age in years	0 - 10	10- 20	20- 30	30- 40	40- 50	50- 60	60- 70
Number of people affected	3	5	16	18	12	7	4

Find its standard deviation.

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12. The measurements of the diameters (in cm) of the plates prepared in a factory are given below. Find its standard deviation.

Diameter (cm)	21- 24	25- 28	29- 32	33- 36	37- 40	41- 44
Number of plates	15	18	20	16	8	7

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13. The time taken by 50 students to complete a 100 meter race are given below. Find its standard deviation.

Time taken (sec)	8.5-9.5	9.5-10.5	10.5-11.5	11.5-12.5	12.5-13.5
Number of students	6	8	17	10	9

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14. For a group of 100 candidates the mean and standard deviation of their marks were found to be 60 and 15 respectively. Later on it was found that the scores 45 and 72 were wrongly entered as 40 and 27. Find the correct means and standard deviation.

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1. The mean and variance of seven observations are 8 and 16 respectively. If five of these are 2,4,10,12 and 14, then find the remaining two observations.



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2. The standard deviation and mean of a data are 6.5 and 12.5 respectively. Find the coefficient of variation.



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3. The standard deviation and coefficient of variation of a data are 1.2 and 25.6 respectively. Find the value of mean.



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4. If the mean and coefficient of variation of a data are 15 and 48 respectively, then find the value of standard deviation.

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5. If $n = 5$, $\bar{x} = 6$, $\sum x^2 = 765$, then calculate the coefficient of variation.

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6. Find the coefficient of variation of 24,26,33,37,29,31.

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7. The time taken (in minutes) to complete a homework by 8 students in a day are given by 38,40,47,44,46,43,49,53. Find the coefficient of variation.

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8. The total marks scored by two students Sathya and Vidhya in 5 subjects are 460 and 480 with standard deviation 4.6 and 2.4 respectively. Who is more consistent in performance ?

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9. The mean and standard deviation of marks obtained by 40 students of a class in three subjects Mathematics, Science and Social Science are given below.

Subject	Mean	SD
Mathematics	56	12
Science	65	14
Social Science	60	10

Which of the three subjects shows highest variation and which shows lowest variation in marks ?

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10. The temperature of two cities A and B in a winter season are given below.

Temperature of city A (in degree Celsius)	18	20	22	24	26
Temperature of city B (in degree Celsius)	11	14	15	17	18

Find which city is more consistent in temperature changes ?

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Exercise 8 3

1. Write the sample space for tossing three coins using tree diagram.

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2. Write the sample space for selecting two balls from a bag containing 6 balls numbered 1 to 6 (using tree diagram).



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3. If A is an event of a random experiment such that $P(A) : P(\bar{A}) = 17 : 15$ and $n(S) = 640$ then find (i) $P(\bar{A})$ (ii) $n(A)$.



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4. A coin is tossed thrice. What is the probability of getting two consecutive tails ?



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5. At a fete, cards bearing numbers 1 to 1000, one number on one card are put in a box. Each player selects one card at random and that card is not replaced. If the selected card has a perfect square number greater than 500, the player wins a prize. What is the probability that (i) the first player wins a prize (ii) the second player wins a prize, if the first has won ?



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6. A bag contains 12 blue balls and x red balls. If one ball is drawn at random (i) what is the probability that it will be a red ball ? (ii) If 8 more red balls are put in the bag, and if the probability of drawing a red ball will be twice that of the probability in (i), then find x .

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7. Two unbiased dice are rolled once. Find the probability of getting.

(i) a doublet (equal numbers on both dice)

(ii) the product as a prime number

(iii) the sum as a prime number

(iv) the sum as 1

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8. Three fair coins are tossed together. Find the probability of getting (i) all heads (ii) at least one tail (iii) at most one head (iv) at most two tails

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9. Two dice are numbered 1,2,3,4,5,6 and 1,1,2,2,3,3 respectively. They are rolled and the sum of the numbers on them is noted. Find the probability of getting each sum from 2 to 9 separately.

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10. A bag contains 5 red balls, 6 white balls, 7 green balls, 8 black balls. One ball is drawn at random from the bag. Find the probability that the ball drawn is (i) white (ii) black or red (iii) not white (iv) neither white nor black

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11. In a box there are 20 non-defective and some defective bulbs. If the probability that a bulb selected at random from the box found to be defective is $\frac{3}{8}$ then, find the number of defective bulbs.

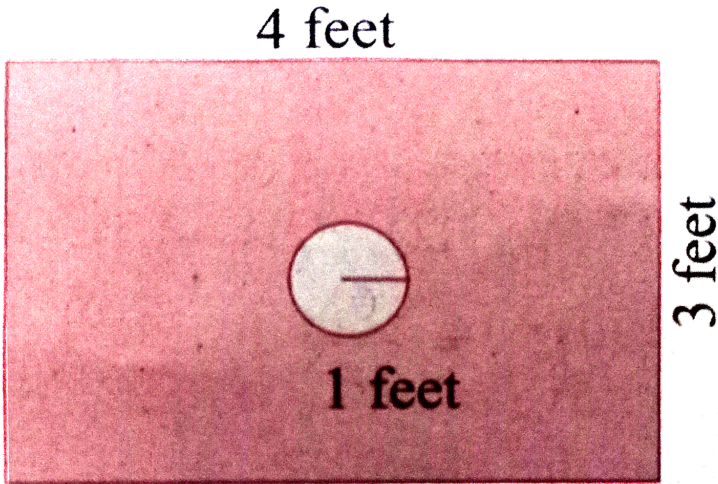
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12. The king and queen of diamonds, queen and jack of hearts, jack and king of spades are removed from a deck of 52 playing cards and then well shuffled. Now one card is drawn at random from the remaining cards. Determine the probability that the card is (i) a clavor (ii) a queen of red card (iii) a king of black card

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13. Some boys are playing a game, in which the stone thrown by them landing in a circular region (give in the figure) is considered as win and landing other than the circular region is considered as loss. What is the

probability to win the game ?



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14. Two customers Priya and Amuthan are visiting a particular shop in the same week (Monday to Saturday). Each is equally likely to visit the shop on any one day as on another day. What is the probability that both will visit the shop on (i) the same day (ii) different days (iii) consecutive days ?

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15. In a game, the entry fee is Rs. 150. The game consists of tossing a coin 3 times. Dhana bought a ticket for entry. If one or two heads show, she gets her entry fee back. If she throws 3 heads, she receives double the entry fees. Otherwise she will lose. Find the probability that she (i) gets double entry fee (ii) just gets her entry fee (iii) loses the entry fee.



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Exercise 8 4

1. If $P(A) = \frac{2}{3}$, $P(B) = \frac{2}{5}$, $P(A \cup B) = \frac{13}{15}$ then find $P(A \cap B)$.



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2. A and B are two events such that, $P(A) = 0.42$, $P(B) = 0.48$, and $P(A \cap B) = 0.16$. Find (i) P (not A) (ii) P (not B) (iii) P (A or B)



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3. If A and B are two mutually exclusive events of a random experiment and $P(\text{not } A) = 0.45$, $P(A \cup B) = 0.65$, then find $P(B)$.

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4. The probability that atleast one of A and B occur is 0.6. If A and B occur simultaneously with probability 0.2, then find $P(\bar{A}) + P(\bar{B})$.

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5. The probability of happening of an event A is 0.5 and that of B is 0.3. If A and B are mutually exclusive events, then find the probability that neither A nor B happen.

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6. Two dice are rolled once. Find the probability of getting an even number on the first die or a total of face sum 8.



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7. From a well-shuffled pack of 52 cards, a card is drawn at random. Find the probability of it being either a red king or a black queen.



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8. A box contains cards numbered 3,5,7,9,..,35,37. A card is drawn at random from the box. Find the probability that the drawn card have either multiples of 7 or a prime number.



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9. Three unbiased coins are tossed once. Find the probability of getting atmost 2 tails or atleast 2 heads.

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10. The probability that a person will get an electrification contract is $\frac{3}{5}$ and the probability that he will not get plumbing contract is $\frac{5}{8}$. The probability of getting atleast one contract is $\frac{5}{7}$. What is the probability that he will get both ?

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11. In a town of 8000 people, 1300 are over 50 years and 3000 are females. It is known that 30% of the females are over 50 years. What is the probability that a chosen individual from the town is either a female or over 50 years ?

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12. A coin is tossed thrice. Find the probability of getting exactly two heads or atleast one tail or two consecutive heads.

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13. If A, B, C are any three events such that probability of B is twice as that of probability of A and probability of C is thrice as that of probability of A and

$$P(A \cap B) = \frac{1}{6}, P(B \cap C) = \frac{1}{4}, P(A \cap C) = \frac{1}{8}, P(A \cup B \cup C) = \frac{9}{10},$$

then find $P(A)$, $P(B)$ and $P(C)$?

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14. In a class of 35, students are numbered from 1 to 35. The ratio of boys to girls is 4 : 3. The roll numbers of students begin with boys and end with girls. Find the probability that a student selected is either a boy with prime roll number or a girl with composite roll number or an even roll number.



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Exercise 8 5

1. Which of the following is not a measure of dispersion ?

- A. Range
- B. Standard deviation
- C. Arithmetic mean
- D. Variance

Answer: C



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2. The range of the data 8,8,8,8,8 is

- A. 0

B. 1

C. 8

D. 3

Answer: A



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3. The sum of all deviations of the data from its mean is

A. Always positive

B. always negative

C. zero

D. non-zero integer

Answer: C



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4. The mean of 100 observations is 40 and their standard deviation is 3.

The sum of all observation is ____.

A. 40000

B. 160900

C. 160000

D. 30000

Answer: B



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5. Variance of first 20 natural numbers is

A. 32.25

B. 44.25

C. 33.25

D. 30

Answer: C



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6. The standard deviation of a data is 3 . If each value is multiplied by 5 then the new variance is

A. 3

B. 15

C. 5

D. 225

Answer: D



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7. If the standard deviation of x, y, z is p then the standard deviation of

$3x + 5, 3y + 5, 3z + 5$ is ___.

A. $3p+5$

B. $3p$

C. $p+5$

D. $9p+15$

Answer: B



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8. If the mean and coefficient of variation of a data are 4 and 87.5 % then the standard deviation is

A. 3.5

B. 3

C. 4.5

D. 2.5

Answer: A

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9. Which of the following is incorrect ?

A. $P(A) > 1$

B. $0 \leq P(A) \leq 1$

C. $P(\phi) = 0$

D. $P(A) + P(\bar{A}) = 1$

Answer: A

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10. The probability a red marble selected at random from a jar containing p red, q blue and r green marbles is

A. $\frac{q}{p + q + r}$

B. $\frac{p}{p + q + r}$

C. $\frac{p + q}{p + q + r}$

D. $\frac{p + r}{p + q + r}$

Answer: B



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11. A page is selected at random from a book. The probability that the digit at units place of the page number chosen is less than 7 is

A. $\frac{3}{10}$

B. $\frac{7}{10}$

C. $\frac{3}{9}$

D. $\frac{7}{9}$

Answer: B



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12. The probability of getting a job for a person is $\frac{x}{3}$. If the probability of not getting the job is $\frac{2}{3}$ then the value of x is

A. 2

B. 1

C. 3

D. 1.5

Answer: B



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13. Kamalam went to play a lucky draw contest. 135 tickets of the lucky draw were sold. If the probability of Kamalam winning is $\frac{1}{9}$, then the number of tickets bought by Kamalam is

A. 5

B. 10

C. 15

D. 20

Answer: C



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14. If a letter is chosen at random from the English alphabets {a, b,..., z}, then the probability that the letter chosen precedes x

A. $\frac{12}{13}$

B. $\frac{1}{13}$

C. $\frac{23}{26}$

D. $\frac{3}{26}$

Answer: C



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15. A purse contains 10 notes of Rs. 2000, 15 notes of Rs. 500, and 25 notes of Rs. 200. One note is drawn at random. What is the probability that the note is either a Rs. 500 note or Rs. 200 note ?

A. $\frac{1}{5}$

B. $\frac{3}{10}$

C. $\frac{2}{3}$

D. $\frac{4}{5}$

Answer: D



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Unit Exercise 8

1. The mean of the following frequency distribution is 62.8 and the sum of all frequencies is 50. Compute the missing frequencies f_1 and f_2 .

Class Interval	0-20	20-40	40-60	60-80	80-100	100-120
Frequency	5	f_1	10	f_2	7	8

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2. The diameter of circles (in mm) drawn in a design are given below.

Diameters	33-36	37-40	41-44	45-48	49-52
Number of circles	15	17	21	22	25

Calculate the standard deviation.

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3. The frequency distribution is given below.

x	k	$2k$	$3k$	$4k$	$5k$	$6k$
f	2	1	1	1	1	1

In the table, k is a positive integer, has a variance of 160. Determine the value of k .

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4. The standard deviation of some temperature data in degree celsius ($^{\circ}C$) is 5. If the data were converted into degree Fahrenheit ($^{\circ}F$) then what is the variance ?

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5. If for a distribution, $\sum (x - 5) = 3$, $\sum (x - 5)^2 = 43$ and total number of observations is 18, find the mean and standard deviation.

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6. Prices of peanut packets in various places of two cities are given below.

In which city, prices were more stable ?

Prices in city A 20 22 19 23 16

Prices in city B 10 20 18 12 15

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7. If the range and coefficient of range of the data are 20 and 0.2 respectively, then find the largest and smallest values of the data.

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8. If two dice are rolled, then find the probability of getting the product of face value 6 or the difference of face values 5.

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9. In a two children family, find the probability that there is at least one girl in a family.

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10. A bag contain 5 white and some black balls. If the probability of drawing a black ball from the bag is twice the probability of drawing a white ball then find the number of black balls.



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11. The probability that a student will pass the final examination in both English and Tamil is 0.5 and the probability of passing neither is 0.1 . If the probability of passing the English examination is 0.75, what is the probability of passing the Tamil examination ?



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12. The King , Queen and Jack of the suit spade are removed from a deck of 52 cards. One card is selected from the remaining cards. Find the probability of getting (i) a diamond (ii) a queen (iii) a spade (iv) a heart card bearing the number 5.



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1. A letter is chosen at random from the letter of the word "PROBABILITY".

Find the probability that it is not a vowel.

A. $\frac{1}{5}$

B. $\frac{2}{3}$

C. $\frac{1}{3}$

D. $\frac{3}{5}$

Answer: B



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2. The standard deviation of a data is 5. If each value is multiplied by 2, then the new variance is

A. 3

B. 100

C. 10

D. 225

Answer: B



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3. The number of books read by 8 students during a month are 2,5,8,11,14,6,12 and 10. Calculate the standard deviation of the data.



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4. A coin is tossed twice. What is the probability of getting exactly one head ?



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5. Two dice, one blue and one grey, are thrown at the same time. Write down all the possible outcomes. What is the probability that the sum of

the two numbers appearing on the top of the dice is

8

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6. Find the standard deviation for the following data.

x 10 15 18 20 25

f 3 2 5 8 2

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Additional Question Answers

1. Find the standard deviation of 30,80,60,70,20,40,50 using the direct method.

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2. Find the standard deviation for the following data. 5,10,15,20,25. And also find the new S.D. if three is added to each value.

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3. The marks scored by 5 students in a test for 50 marks are 20,25,30,35,40. Find the S.D for the marks. If the marks are converted for 100 marks, find the S.D. fro newly obtained marks.

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4. $\sum x = 99, n = 9, \sum (x - 10)^2 = 79,$ then find,
(i) $\sum x^2$ (ii) $\sum (x - \bar{x})^2$

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5. Find the co-efficient of variation for the following data : 16,13,17,21,18.



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6. C.V. of a data is 69%, S.D. is 15.6, then find its mean.



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7. S.D. of a data is 21.2, mean is 36.6, then find its C.V.



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8.

Team A	50	20	10	30	30
Team B	40	60	20	20	10

Which team is more consistent ?



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9. Find the probability of choosing a spade or a heart card from a deck of cards.



Unit Test Section A

1. Which of the following is not a measure of dispersion ?

- A. Range
- B. Standard deviation
- C. Arithmetic mean
- D. Variance

Answer:

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2. If the mean and coefficient of variation of a data are 4 and 87.5 % then the standard deviation is

A. 3.5

B. 3

C. 4.5

D. 2.5

Answer:



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3. A page is selected at random from a book. The probability that the digit at units place of the page number chosen is less than 7 is

A. $\frac{3}{10}$

B. $\frac{7}{10}$

C. $\frac{3}{9}$

D. $\frac{7}{9}$

Answer:

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4. Kamalam went to play a lucky draw contest. 135 tickets of the lucky draw were sold. If the probability of Kamalam winning is $\frac{1}{9}$, then the number of tickets bought by Kamalam is

- A. 5
- B. 10
- C. 15
- D. 20

Answer:

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5. A purse contains 10 notes of Rs. 2000, 15 notes of Rs. 500, and 25 notes of Rs. 200. One note is drawn at random. What is the probability that the note is either a Rs. 500 note or Rs. 200 note ?

A. $\frac{1}{5}$

B. $\frac{3}{10}$

C. $\frac{2}{3}$

D. $\frac{4}{5}$

Answer:

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Unit Test Section B

1. If the range and the smallest value of a set of data are 36.8 and 13.4 respectively, then find the largest value.

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2. The time taken (in minutes) to complete a homework by 8 students in a day are given by 38,40,47,44,46,43,49,53. Find the coefficient of variation.



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