PROBLEMS BASED ON STATISTICS

Q.1: Find the mean of 5,10,15,20,25.

SOLUTION-

Add all the numbers first:

Total: 5+10+15+20+25 = 75

Now divide the total from 5, to get the mean.

Mean = 75/5 = 15

Q.2: Find the mean of the given data set: 10,20,30,40,50,60,70,80,90.

SOLUTION-

Add all the given data set : 10+20+30+40+50+60+70+80+90=450

Total: 10+20+30+40+50+60+70+80+90=450

Now divide the total from 10, to get the mean.

Mean = 450/10 = 45

Q.3: Find the mean of the first 10 even numbers.

SOLUTION-

Add all First ten even numbers :

Total= 2+4+6+8+10+12+14+16+18+20=100

Now divide the total from 10, to get the mean.

Mean = 100/10= 10

Q.4: Find the mean of the first 10 odd numbers.

SOLUTION-

Add all First ten odd numbers :

Total= 1+3+5+7+9+11+13+15+17+19=99

Now divide the total from 10, to get the mean.

Mean = 99/10= 9.9

Find the mode of the following marks (out of 10) obtained by 20 students: 4, 6, 5, 9, 3, 2, 7, 7, 6, 5, 4, 9, 10, 10, 3, 4, 7, 6, 9, 9

SOLUTION=

As we know, a data set or set of values can have more than one mode if more than one value occurs with equal frequency and number of time compared to the other values in the set. Hence, here both the number 9are mode of the set.

2. Find the mode for the following data set. 41, 39, 48, 52, 46, 62, 54, 40, 96, 52, 98, 40, 42, 52, 60

As we know, a data set or set of values can have more than one mode if more than one value occurs with equal frequency and number of time compared to the other values in the set. Hence, here both the number 40, 52 are mode of the set.

1) The marks in a subject for 12 students are as follows: 31, 37, 35, 38, 42, 23, 17, 18, 35, 25, 35, 29 For the given data, find the range.

SOLUTION-

Given,

Highest value = 42

Lowest value = 17

Range = Highest value –Lowest value = 42-17

= 25

1. Given below are heights of 15 students of a class measured in cm: 128, 144, 146, 143, 136, 142, 138, 129, 140, 152, 144, 140, 150, 142, 154 Find the range of the given data.

SOLUTION –

Given,

Highest value = 152

Lowest value = 128

Range = Highest value –Lowest value = 152-128

= 24

1. Calculate the range of the data given below:

Here, Upper-class boundary of the highest interval = 100 Lower class boundary of the lowest interval = 30 Therefore, range = 100-30 = 70

PROBLEMS BASED ON PROBABILITY

Two dice are thrown together. Find the probability that the product of the numbers on the top of the dice is:

SOLUTION-

1) 6

Total number of possible outcomes = 36

Favourable outcome = {(1,6) (2,3) (3,2) (1,6)}

Number of favourable outcomes = 4

Number of possible outcomes = 36

Probability = number of favourable outcomes / number of possible outcomes

Probability of getting a sum of 7 = 4/36

= 1/9

Therefore, the probability of getting the product of the numbers as 6 on the top of the dice is 1/9.

12

Total number of possible outcomes = 36

Favourable outcomes = {(2,6) (3,4) (4,3) (6,2)}

Number of favourable outcomes = 4

Number of possible outcomes = 36

Probability = number of favourable outcomes / number of possible outcomes

Probability = 4/36

= 1/9

Therefore, the probability of getting the product of the numbers as 12 on the top

of the dice is 1/9.

2) A bag contains 10 red, 5 blue and 7 green balls. A ball is drawn at random. Find the probability of this ball being a

SOLUTION-

Not Blue-

Possible outcomes = 10 red ball + 5 blue ball + 7 green ball

Total number of possible outcomes = 10 + 5 + 7 = 22

The probability of the ball not being a blue ball is given by

There are 10 red balls, 7 green balls and 5 blue balls.

Favourable outcomes = 10 red balls + 7 green balls

Number of favourable outcomes = 17

Number of possible outcomes = 22

Probability = number of favourable outcomes / number of possible outcomes

Probability = 17/22

Red Ball

Possible outcomes = 10 red ball + 5 blue ball + 7 green ball

Total number of possible outcomes = 10 + 5 + 7 = 22

The probability of getting a red ball is given by

There are 10 red balls in a bag

Number of favourable outcome = 10

Number of possible outcomes = 22

Probability = number of favourable outcomes / number of possible outcomes

Probability = 10/22

= 5/11

All the jacks, queens and kings are removed from a deck of 52 playing cards. The remaining cards are well shuffled and then one card is drawn at random. Giving ace a value 1 similar value for other cards, find the probability that the card has a value (i) 7 (ii) greater than 7 (iii) less than 7

i) 7

Total cards = 52 − 12 = 40 (12 cards are removed)

card with number 7 = 4

favourable cases = 4

probability = $\frac{Number\ of\ favourable\ cases}{Total\ number\ of\ cases}$

Probability of getting card 7= $\frac{4}{10} = \frac{1}{10}$

ii) More than 7

Total cards = 52 − 12 = 40 (∵ 12 cards are removed)

Cards greater than 7 =8,9,10 (3 × 4 = 12)

favourable cases = 12

probability = $\frac{Number\ of\ favourable\ cases}{Total\ number\ of\ cases}$

Probability of getting card 7= $\frac{12}{40} = \frac{3}{10}$

iii) Less than 7

otal cards = 52 − 12 = 40 (∵ 12 cards are removed)

Cards less than 7 = 1, 2, 3, 4, 5, 6 (6 × 4 = 24)

favourable cases = 24

probability = $\frac{Number\ of\ favourable\ cases}{Total\ number\ of\ cases}$

Probability of getting card 7= $\frac{24}{40} = \frac{6}{10} = \frac{3}{5}$

4. A die has its six faces marked 0, 1, 1, 1, 6, 6. Two such dice are thrown together and the total score is recorded. (i) How many different scores are possible? (ii) What is the probability of getting a total of 7?

Solution -

Different scores that are possible as a combination of both dices are thrown -
(0,0) = 0
(0,1) = 1
(0,6) = 6
(1,1) = 2
(1,6) = 7
(6,6) = 12

To get a score of 7, one dice must show 1 and one dice must show 6.
Probability of dice getting 1 = 3/6 = 1/2.
Probability of dice getting 6 = 2/6 = 1/3.

Thus probability of getting score 7 is =
1/2 * 1/3 + 1/2*1/3 = 1/3.

PROBLEMS BASED ON CALCULAS

Differentiate f(x) = 6x3 – 9x + 4

Solution –

$18x2-9$

Differentiate f(x) = x3 – 2x2 + x – 1

Solution-

3 - 4x – 1