1. Mean is the average of the given numbers and is calculated by dividing the sum of given numbers by the total number of numbers.

Mean = Sum of the Given Data/Total number of Data

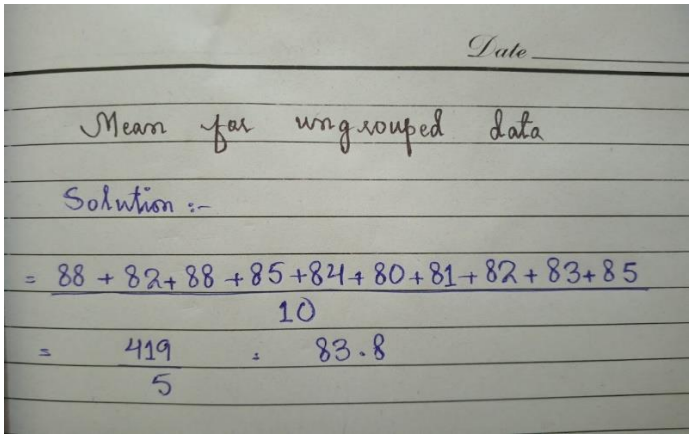
$x=\sum x/n$

Mean for Ungrouped Data

The example given below will help you in understanding **how to find the mean** of ungrouped data.

Example:

In a class there are 20 students and they have secured a percentage of 88, 82, 88, 85, 84, 80, 81, 82, 83, 85, 84, 74, 75, 76, 89, 90, 89, 80, 82, and 83.

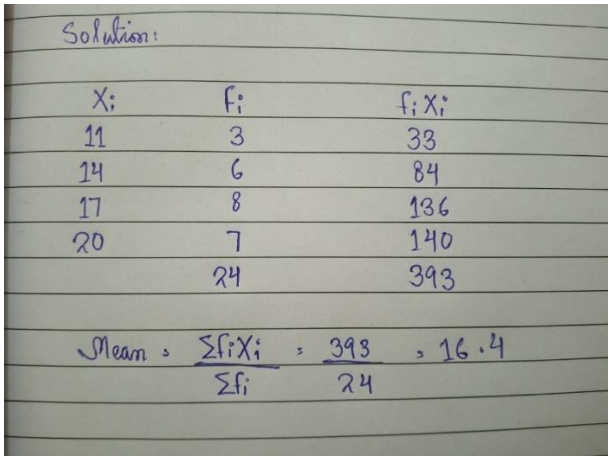


Mean for Grouped Data

Example:

Find the mean for the following distribution.

x_i	11	14	17	20
f_i	3	6	8	7

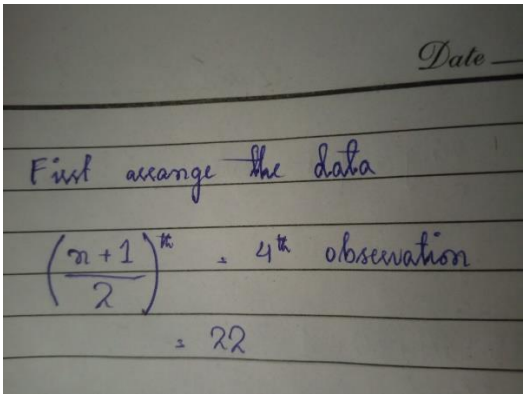


2. Median: The median is the middle value of a dataset when it is ordered in ascending or descending order. If the number of data points is even, the median is the average of the two middle numbers.

Ungrouped Data

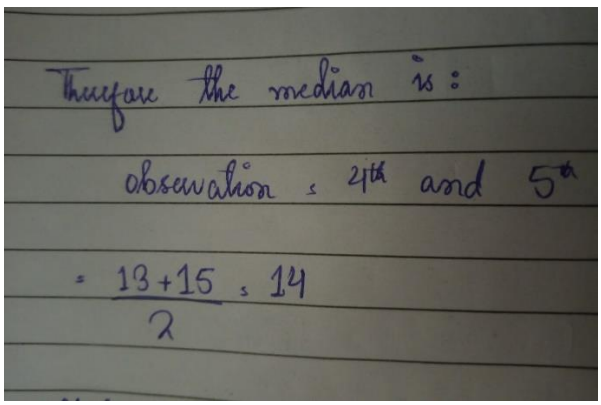
1) Find the median of the following set of data

20, 25, 21, 24, 22, 32, 18



2) Find the median of the following set of data

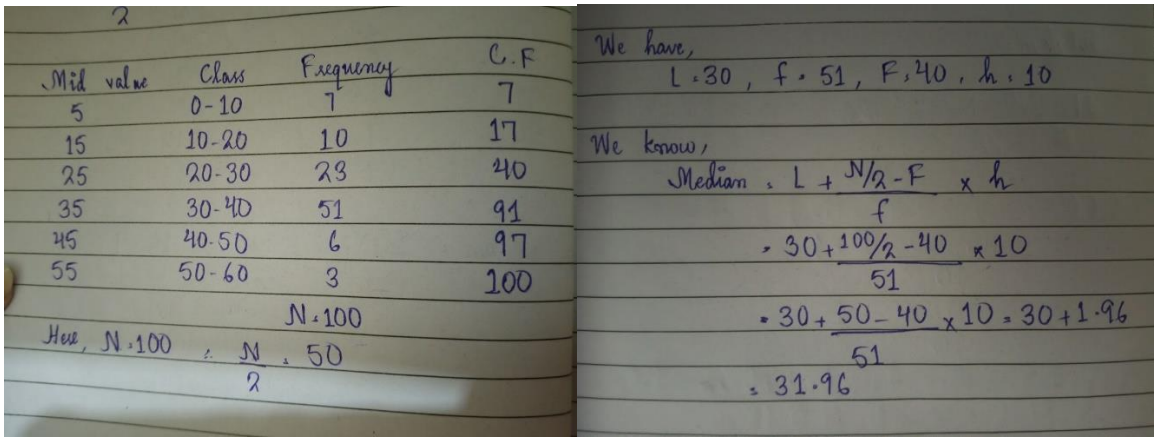
13, 8, 19, 30, 15, 21, 9, 5



Grouped Data

Compute the median from the following data.

Mid-value	5	15	25	35	45	55
Frequency	7	10	23	51	6	3



Mid value	Class	Frequency	C.F
5	0-10	7	7
15	10-20	10	17
25	20-30	23	40
35	30-40	51	91
45	40-50	6	97
55	50-60	3	100
		N = 100	

Here, $N = 100 \Rightarrow \frac{N}{2} = 50$

We have,
$L = 30,\ f = 51,\ F = 40,\ h = 10$

We know,

$$\text{Median} = L + \frac{N/2 - F}{f} \times h$$

$$= 30 + \frac{100/2 - 40}{51} \times 10$$

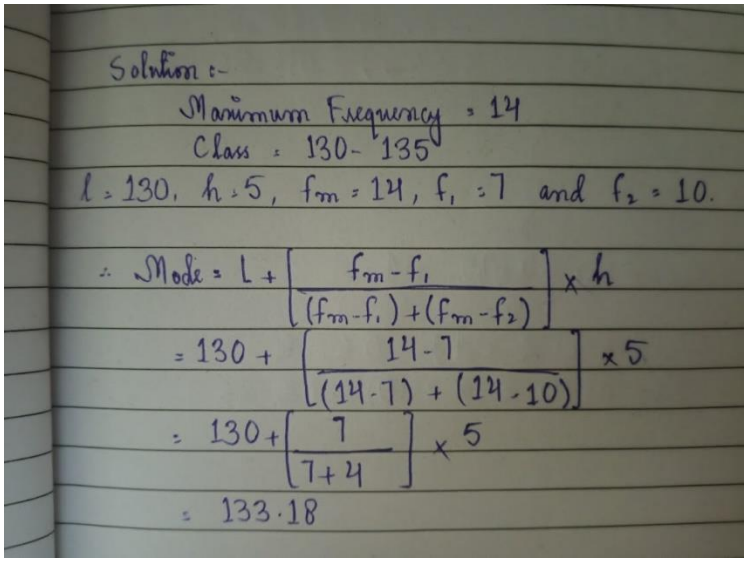
$$= 30 + \frac{50 - 40}{51} \times 10 = 30 + 1.96$$

$$= 31.96$$

3. Mode: The mode is the value that appears most frequently in a dataset. A dataset may have one mode, more than one mode, or no mode at all.

Example: The heights of 50 students are given below in cm. Find the mode.

Height (in cm)	125-130	130-135	135-140	140-145	145-150
Number of students	7	14	10	10	9



Solution :-

Maximum Frequency = 14

Class = 130 - 135

$l = 130,\ h = 5,\ f_m = 14,\ f_1 = 7$ and $f_2 = 10$.

$$\therefore \text{Mode} = L + \left[\frac{f_m - f_1}{(f_m - f_1) + (f_m - f_2)}\right] \times h$$

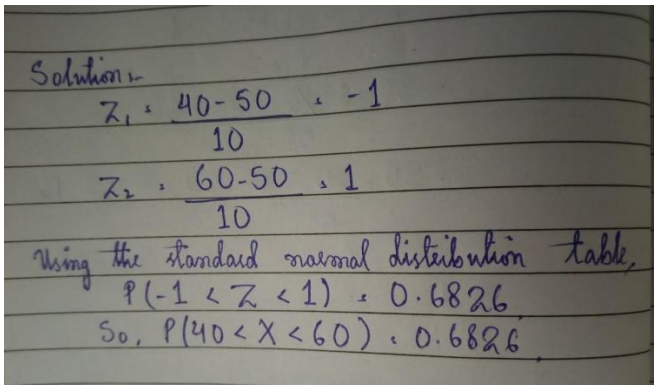
$$= 130 + \left[\frac{14 - 7}{(14 - 7) + (14 - 10)}\right] \times 5$$

$$= 130 + \left[\frac{7}{7 + 4}\right] \times 5$$

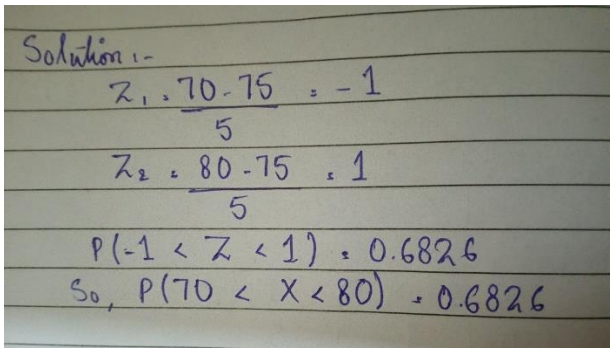
$$= 133.18$$

Normal Distribution Problems

Problem 1: Given a normal distribution with mean $\mu=50$\mu = 50$\mu=50$ and standard deviation $\sigma=10$\sigma = 10$\sigma=10$, find the probability that XXX is between 40 and 60.

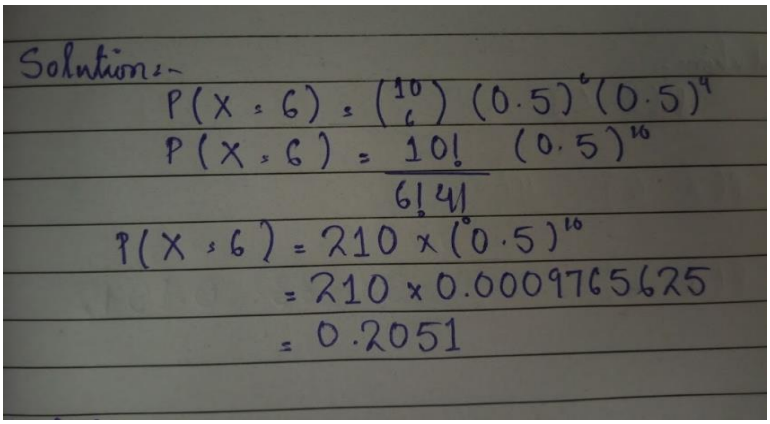


Problem 2: Given a normal distribution with mean $\mu=75$\mu = 75$\mu=75$ and standard deviation $\sigma=5$\sigma = 5$\sigma=5$, find the probability that XXX is between 70 and 80.

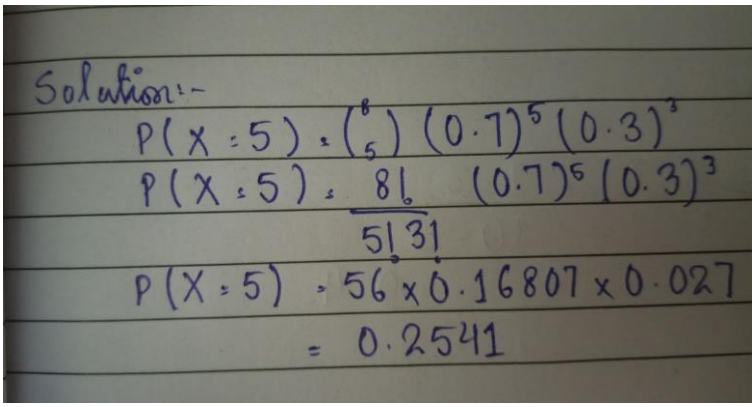


Binomial Distribution Problems

Problem 1: A coin is flipped 10 times. What is the probability of getting exactly 6 heads? (Assume $p=0.5$p = 0.5$p=0.5$)

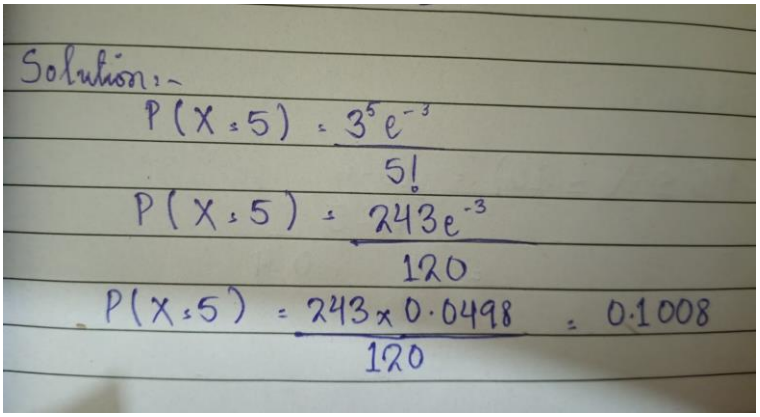


Problem 2: A basketball player has a 70% chance of making a free throw. If she takes 8 shots, what is the probability of making exactly 5 shots?

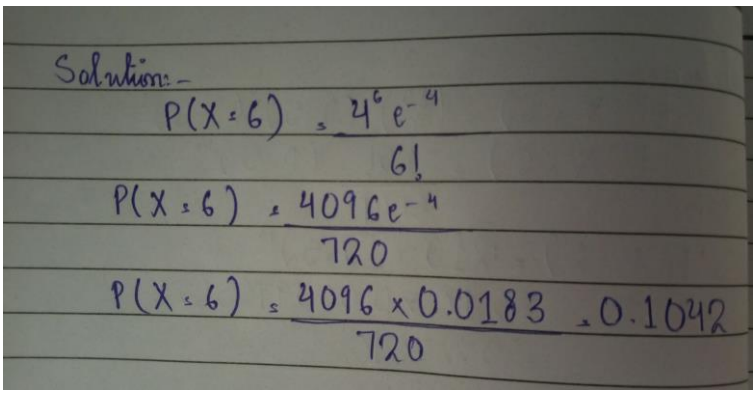


Poisson Distribution Problems

Problem 1: If a bookstore sells an average of 3 books per hour, what is the probability that exactly 5 books will be sold in an hour?

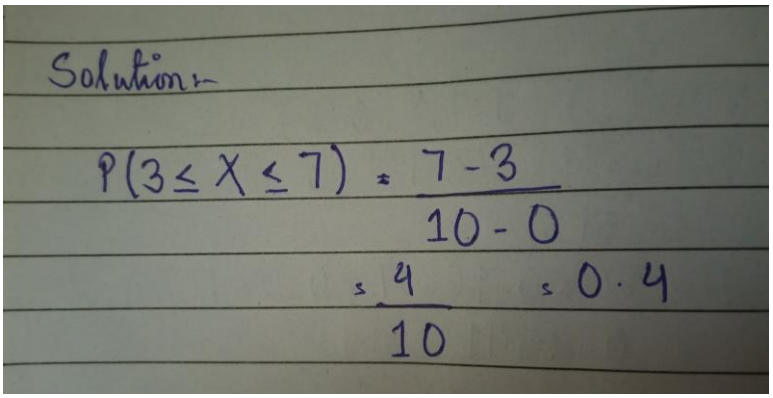


Problem 2: A car rental service rents an average of 4 cars per day. What is the probability of renting exactly 6 cars in a day?

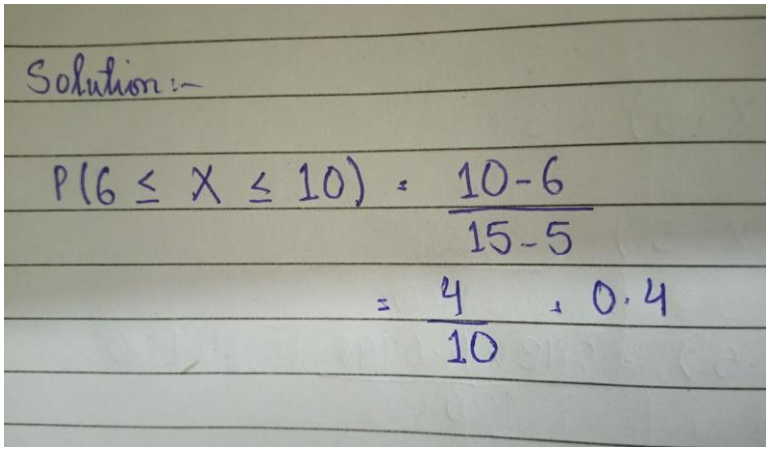


Uniform Distribution Problems

Problem 1: For a uniform distribution ranging from 0 to 10, what is the probability of selecting a value between 3 and 7?



Problem 2: For a uniform distribution ranging from 5 to 15, what is the probability of selecting a value between 6 and 10?



To be continued.....