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SUBJECT: PROBABILITY AND STATISTICS.

SUBMITTED TO : SIR DAUD KHAN

Q1: Construct a grouped distribution table for the following data and Calculate Mean, Mode Median and Quartiles.

423, 369, 387, 411, 393, 394, 371, 377, 389, 409, 392, 408, 431, 401, 363, 391, 405, 382, 400, 381, 399, 415, 428, 422, 396, 372, 410, 419, 386, 390

class	Tally	Frequency (f)	C.f	Class.B	x	fx
360–369	2	2	2	359.5-369.5	364.5	729
370–379	3	3	5	369.5-379.5	374.5	1123.5
380–389	5	5	10	379.5-389.5	384.5	1922.5
390–399	7	7	17	389.5-399.5	394.5	2761.5
400–409	5	5	22	399.5-409.5	404.5	2022.5
410–419	4	4	26	409.5-419.5	414.5	1658
420–429	3	3	29	419.5-429.5	424.5	1273.5
430–439	1	1	30	429.5-439.5	434.5	434.5
Total		30				11914

MEAN:

Fx/f

ANSWER:

11914/30 = 397.13

MODE:

L+fm-f0/(fm-fm-1)+(fm-fm+1)

389.5+8-3/2(8)-3-5(399.5-389.5)

389.5+5/16-8(11)

3131/8

3918

MEDIAN:

L=389.5(lower class boundries of 9390-399)

n= 30

b= 2+3+5=10

G=7

W=10

$=389.5+\frac{(30/2)-10}{7}*10$

$=389.5+\frac{(15)-10}{7}*10$

=389.5+0.7143

=390.21

QUARTILE:

L+h/f(q-c)

Q=n/u=30/4=7.5

Q1=389.5+11/3(7.5-7)

= 389.5/1+5.5/3

Q2=11535-55/3+5.5/3=1148/3=382.66

L+h/f(q3-c)

Q3=3n/4=3*30/4=30/4=22.4

Q3=40.65+11/5(22.5-20)

Q3=406.5+11/5(2-5)

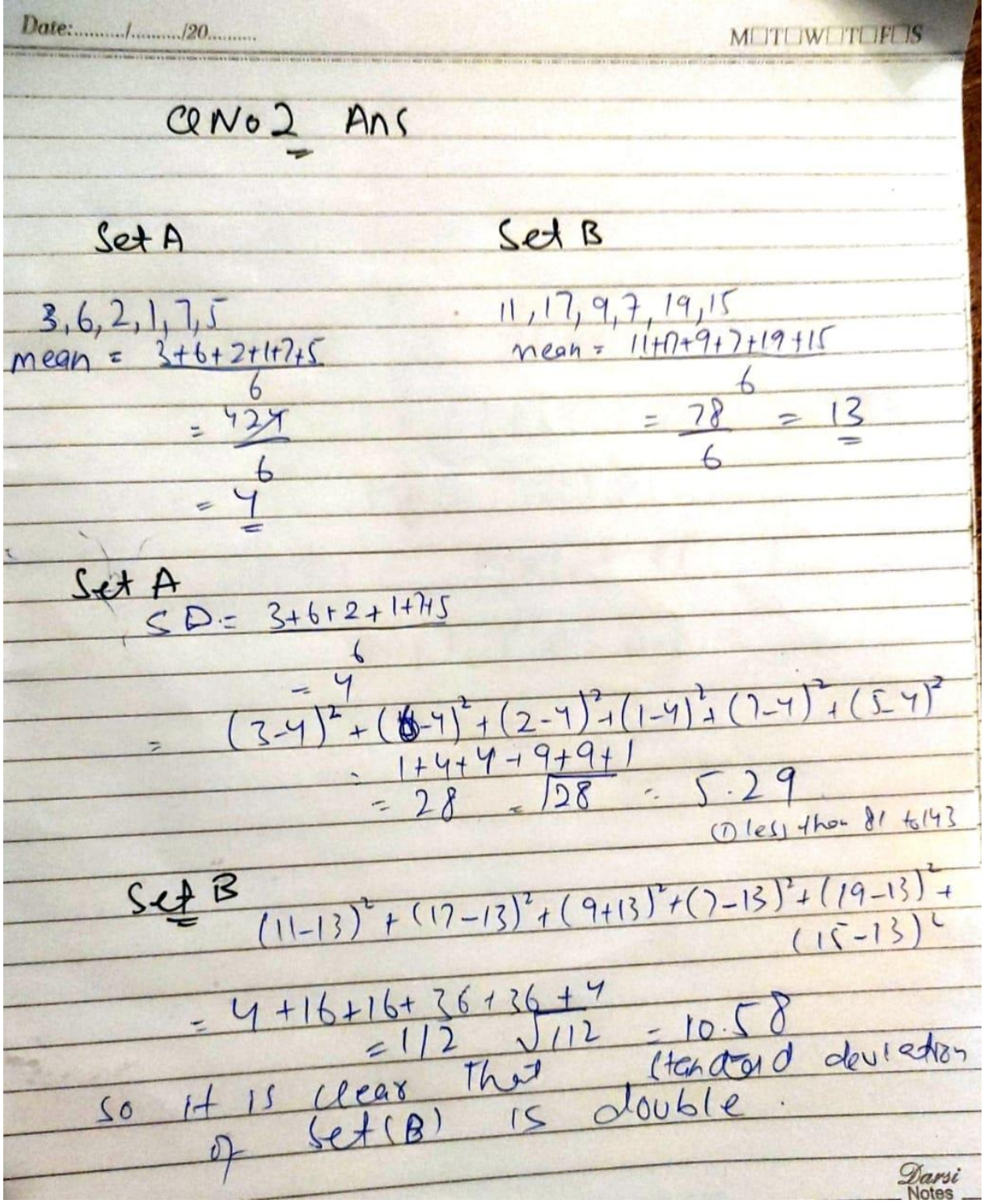
=2032.5+27.5/5

=2060/5

=412 ans

Q2: By multiplying each of the numbers 3,6,2,1,7,5 by 2 and then adding 5, we obtain 11,17,9,7,19,15. What is the relation between the standard deviation and the means of the ,two sets.

ANSWER:



Q3: For the following grouped distribution table Calculate The Variance and Standard Deviation

ANSWER:

Date:...../...../20..... M□T□W□T□F□S

QNo 3 Ans

Class	frequency	C.F	x	$\bar{x}=fx$	x^2	fx^2
64-84	15	15	74	1110	5476	82140
85-104	18	33	94.5	1701	893025	160744.5
105-124	27	60	114.5	3091.5	13110.25	359976.75
125-144	10	70	134.5	1345	18690.25	186902.5
145-164	6	76	154.5	927	23870.25	143221.5
165-184	5	81	174.5	872.5	30450.25	152251.25
185-204	13	94	194.5	2528.5	37830.25	491793.25
	94			11575.5	Total	1571029.75
					138357.5	

$$S^2_2 = \frac{\Sigma fx^2}{n} - \left(\frac{\Sigma fx}{n}\right)^2$$

$$\frac{1571029.75}{94} - \left(\frac{11575.5}{94}\right)^2$$

$$= 16713.082 - 15164.35$$

$$S^2_2 = 1548.73$$

$$\text{Standard deviation} = \sqrt{1548.73}$$

$$= 39.35$$

Q4: If two fair dice are thrown, what is the probability of getting

1. A double six
2. A sum of 8 or more dots

ANSWER:

The sample space S is represented by the following 36 outcomes

S= {(1,1),(1,2),(1,3),(1,4),(1,5),(1,6)

(2,1),(2,2),(2,3),(2,4),(2,5),(2,6)

(3,1),(3,2),(3,3),(3,4),(3,5),(3,6)

(4,1),(4,2),(4,3),(4,4),(4,5),(4,6)

(5,1),(5,2),(5,3),(5,4),(5,5),(5,6)

(6,1),(6,2),(6,3),(6,4),(6,5),(6,6)}

1. Let A be the event that double six occurs

A= {(6,6)} and thus

P(A) =1/36

2. Let B denotes that a sum of 8 or more dots occurs

B= {(2,6),(3,5),(3,6),(4,4),(4,5),(4,6),(5,3),(5,4),(5,5),(5,6),(6,2),(6,3),(6,4),(6,5),(6,6)}

Hence

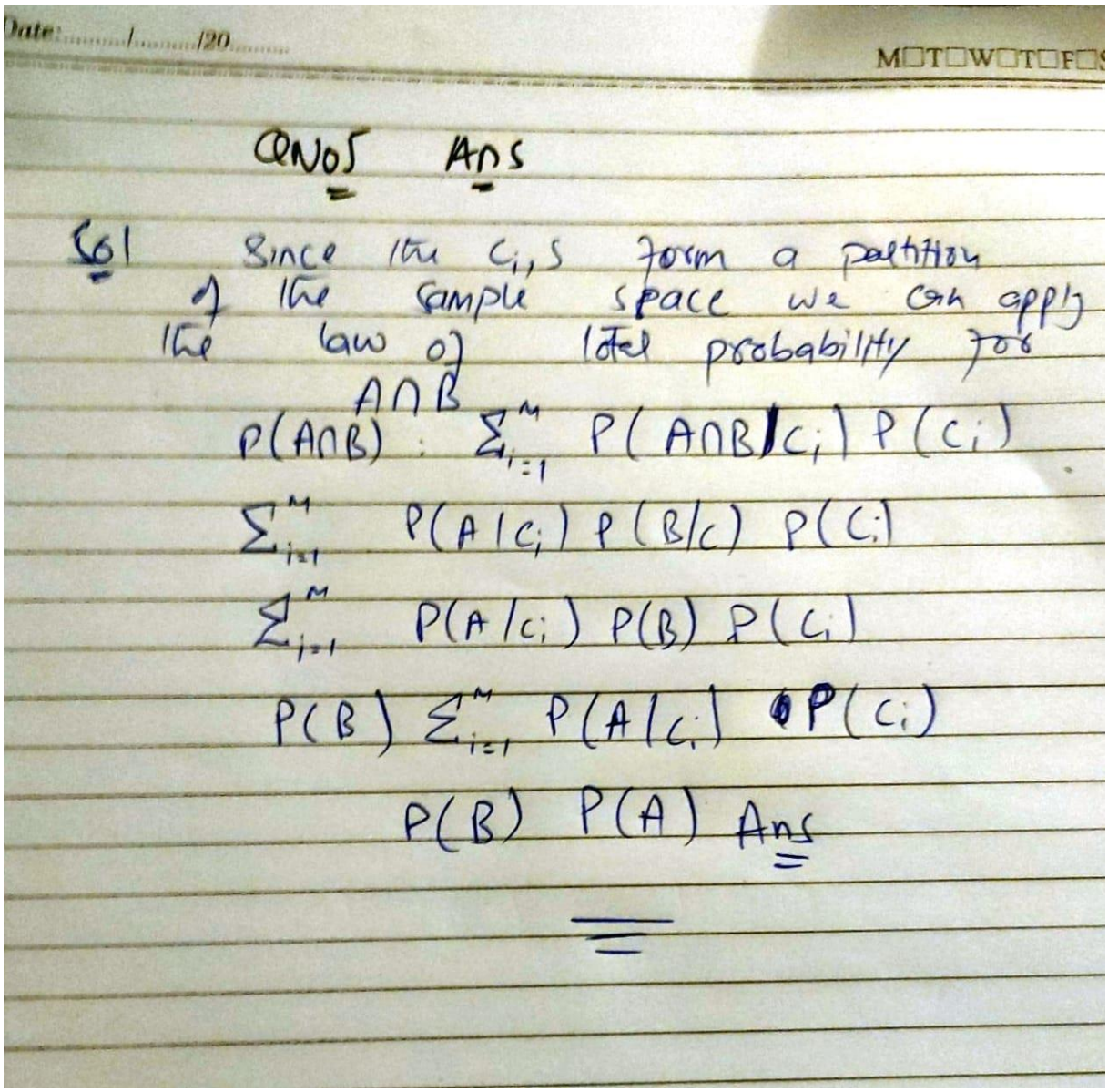
P(B) = 15/36 = 5/12.

Q5. Let C1,C2,⋯,CMC1,C2,⋯,CM be a partition of the sample space SS, and AA and BB be two events. Suppose we know that

- A and B are conditionally independent given C_i, for all $i \in \{1,2,\cdots,M\}$
- B is independent of all C_i**s.**

Prove that A and B are independent.

ANSWER:



The end☺