SOLUTIONS EXAM I Practice
MATH 1342 SPRING 2018.

I

① $\bar{x} = \frac{\Sigma x}{n} = \frac{7+(-2)+(-6)+10+1+13}{n=6}$

$= \frac{23}{6}$

$= \boxed{3.8}$

② Order the data: $-6, -2, 1, 7, 10, 13$

$n = \frac{1+7}{2} = \boxed{4}$

③ $R = H_1 - L_0 = 13-(-6) = \boxed{19}$

④ $s^2 = \frac{\Sigma x^2 - \frac{(\Sigma x)^2}{n}}{n-1} \longrightarrow = \frac{359 - \frac{529}{6}}{5}$

$\Sigma x^2 = (7)^2+(-2)^2+(-6)^2+(10)^2+(1)^2+(13)^2$

$= 49+4+36+100+1+169$

$= 359$

$(\Sigma x)^2 = (23)^2 = 529$

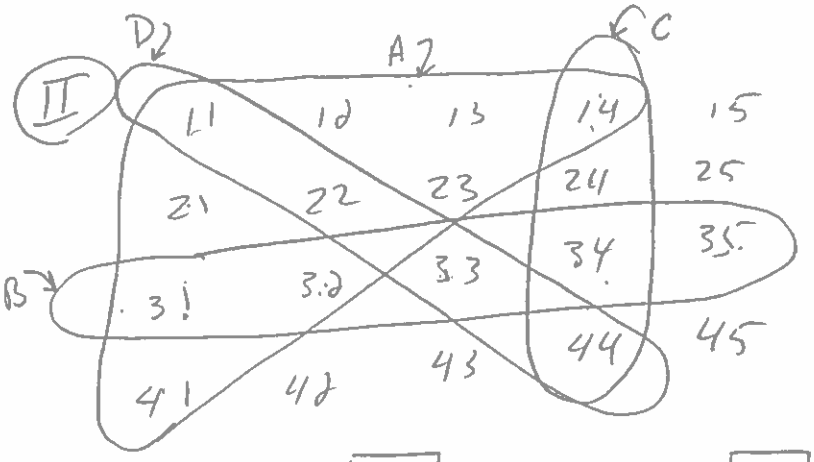
$= \frac{359 - 88.17}{5}$

$= \frac{270.83}{5}$

$= \boxed{54.17}$

⑤ $s = \sqrt{54.17}$

$= \boxed{7.36}$



(6) (i) $P(A) = \boxed{\frac{10}{20}}$ (ii) $P(B) = \boxed{\frac{5}{20}}$ (iii) $P(C) = \boxed{\frac{4}{20}}$ (iv) $P(D) = \boxed{\frac{4}{20}}$

(v) $P(A \text{ or } C) = P(A) + P(C) - P(A \text{ and } C)$

$= \frac{10}{20} + \frac{5}{20} - \frac{1}{20}$ ← Because there is only one outcome in Both A and C,

$= \boxed{\frac{14}{20}}$

(vi) $P(C \text{ and } B) = \boxed{\frac{1}{20}}$ ← BECAUSE THERE IS ONLY ONE OUTCOME IN BOTH A and C.

(vii) $P(B \text{ or } D) = P(B) + P(D) - P(B \text{ and } D)$

$= \frac{5}{20} + \frac{4}{20} - \frac{1}{20}$

$= \boxed{\frac{8}{20}}$

(7) MUST CHECK $P(A \text{ and } B) \stackrel{?}{=} P(A) \cdot P(B)$

Because there are two outcomes in events A and B → $\frac{2}{20} = \frac{1}{10}$

$\left(\frac{10}{20}\right) \cdot \left(\frac{5}{20}\right) = \left(\frac{1}{2}\right) \cdot \left(\frac{1}{4}\right) = \frac{1}{8}$

$\frac{1}{10} \neq \frac{1}{8}$

SINCE THESE DO NOT EQUAL.

A and B ARE NOT INDEPENDENT

(8) MUST CHECK $P(C \text{ and } D) \stackrel{?}{=} P(C) \cdot P(D)$

since, as before, they have one outcome in common → $\frac{1}{20}$

$\left(\frac{4}{20}\right) \cdot \left(\frac{4}{20}\right)$

$\left(\frac{2}{5}\right)\left(\frac{2}{5}\right)$

$\frac{4}{25}$

SINCE THESE DO NOT EQUAL, C and D ARE

NOT INDEPENDENT

(9) $P(Z) = .4$

(10) $P(A \text{ and } Z) = .08$ "where they intersect"

(11) $P(B \text{ or } Z) = P(B) + P(Z) - P(B \text{ and } Z)$

$= .3 + .4 - .0$

$= .7$

(12) Must check: $P(C \text{ and } Y) \stackrel{?}{=} P(C) \cdot P(Y)$

$.18 \neq (.5) \cdot (.6)$

$.30$

SINCE THESE DO NOT EQUAL C and Y

ARE **NOT INDEPENDENT**

(13) MUST CHECK: $P(A \text{ and } Z) \stackrel{?}{=} P(A) \cdot P(Z)$

$.12 = (.2) \cdot (.6)$

$.12$

SINCE THESE EQUAL

A and Z ARE INDEPENDENT

II

	A	B	C	D	TOTAL
Y			.15	.17	.40
Z			.15	.03	.60
TOTAL	.20	.30	.30	.20	1.00

ALL OF THE ABOVE MAY BE FOUND BY TOTALING (ROWS AND) THE COLUMNS. TO FIND A VALUE IN THE 4 MISSING SQUARES, USE THE GIVEN FACT THAT A and Y ARE INDEPENDENT

THUS WE KNOW: $P(A \text{ and } Y) = P(A) \cdot P(Y)$

$= (.20) \cdot (.40)$

THIS GOES AT $= .08$.

THE INTERSECTION OF ROW "Y" AND COLUMN "A."

YOU MAY THEN TOTAL THE ROWS AND COLUMNS TO FIND:

	A	B	C	D	TOTAL
Y	.08	0	.15	.17	.40
Z	.12	.30	.15	.03	.60
TOTAL	.20	.30	.30	.20	1.00

CONT.

SO NOW, READING VALUES FROM THE COMPLETED TABLE GIVES:

(14) $P(Z) = \boxed{.60}$ (15) $P(A \text{ and } Z) = \boxed{.12}$

(16) $P(B \text{ and } Z) = \boxed{.30}$ (17) $P(D) = \boxed{.20}$

(18) $P(C \text{ or } Z) = P(C) + P(Z) - P(C \text{ and } Z)$

$= .30 + .60 - .15$

$= \boxed{.75}$

(19) $P(B \text{ or } Y) = P(B) + P(Y) - P(B \text{ and } Y)$

$= .30 + .40 - 0$

$= \boxed{.70}$

(20) MUST CHECK $P(C \text{ and } Z) \stackrel{?}{=} P(C) \cdot P(Z)$

$\| \qquad\qquad \| \quad \| \qquad\qquad \|$

$.15 \neq .18 \qquad (.30) \cdot (.60)$

SO C and Z ARE

NOT INDEPENDENT