Problem Statement 1:

Is gender independent of education level? A random sample of 395 people were

surveyed and each person was asked to report the highest education level they

obtained. The data that resulted from the survey is summarized in the following table:

High School Bachelors Masters Ph.d. Total

Female 60 54 46 41 201

Male 40 44 53 57 194

Total 100 98 99 98 395

Question: Are gender and education level dependent at 5% level of significance? In

other words, given the data collected above, is there a relationship between the

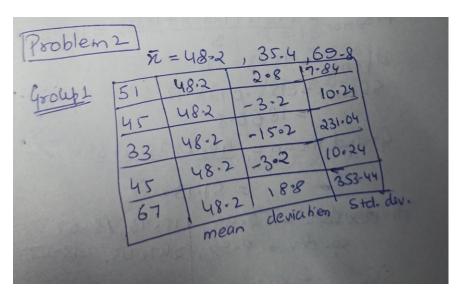gender of an individual and the level of education that they have obtained?

Problem Statement 2:

Using the following data, perform a oneway analysis of variance using α=.05. Write

up the results in APA format.

[Group1: 51, 45, 33, 45, 67]

[Group2: 23, 43, 23, 43, 45]

[Group3: 56, 76, 74, 87, 56]

Problem 2

$\bar{x} = 48.2$, 35.4, 69.8

Group 1

51	48.2	2.8	7.84
45	48.2	-3.2	10.24
33	48.2	-15.2	231.04
45	48.2	-3.2	10.24
67	48.2	18.8	353.44
	mean	deviation	Std. dev.

Group 2

	mean	dev.	std dev
23	35.4	-12.4	153.76
43	35.4	7.6	57.76
23	35.4	-12.4	153.76
43	35.4	7.6	57.76
45	35.4	9.6	92.16

Group 3

	mean	dev	std dev
56	69.8	-13.8	190.44
76	69.8	6.2	38.44
74	69.8	4.2	17.64
87	69.8	17.2	295.84
56	69.8	-13.8	190.44

$MSS = 612.8$, 515.2, 732.8

$var = 153.2$, 128.8, 183.2

$MS_{error} = \dfrac{153.2 + 128.8 + 183.2}{3} = 155.07$

$df_{error} = 15 - 3 = 12$

$SS_{error} = (155.07) * 12$
$\qquad = 1860.8$

$Grand\ mean = \dfrac{48.2 + 35.4 + 69.8}{3}$

$\qquad = 51.13$

$deviation = -2.93; -15.73, 18.67$

$sq.\ dev = 8.58, 247.43, 348.57$

$S.mean = 604.58$

$$\text{Var means} = 302\text{-}29$$
$$\text{MS between} = (302 \cdot 29) \times 5$$
$$= \cancel{} 1511 \cdot 45$$

$$\text{df group} = 2 \quad , \quad \text{SS group} = 1511 \cdot 45 \times 2$$
$$= 3022 \cdot 9$$

$$F = \frac{1511 \cdot 45}{155 \cdot 07} = 9 \cdot 75$$

$$F_{critical}(2,12) = 3 \cdot 89$$

$$\Rightarrow \quad 9 \cdot 77 >> 3 \cdot 89$$

Thus, Reject H₀

Problem Statement 3:

Calculate F Test for given 10, 20, 30, 40, 50 and 5,10,15, 20, 25.

For 10, 20, 30, 40, 50:

Problem 3

Set 1	Set 2
$N = 10, 20, 30, 40, 50$	$N = 5, 10, 15, 20, 25$
$n = 5$	$n = 5$
$\bar{x} = 30$	$\bar{x} = 15$
$SD = 15 \cdot 8114$	$SD = 7 \cdot 9057$
$Var = 250$	$Var = 62 \cdot 5$

$$F\text{-}Test = 250 / 62 \cdot 5$$
$$= \boxed{4}$$