

الأستاذ : ياسر العطرات مدرس رياضيات وإحصاء جامعي جوال: 0551807200

KINGDOM OF SAUDI
ARABIA

King Saud University

Deanship of Common First Year

Basic Sciences Department



المملكة العربية السعودية

جامعة الملك سعود

عمادة السنة الأولى المشتركة

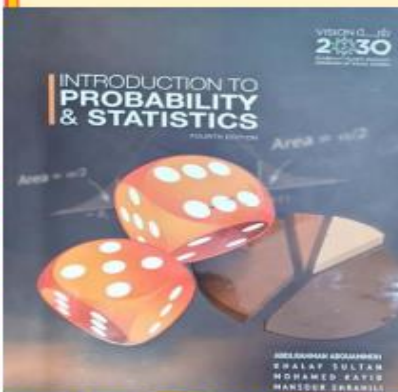
قسم العلوم الأساسية

بادر بالاشتراك بأقوى الدورات لشرح
منهج احص 101 اونلاين على برنامج الزوم

✓ شرح جميع الدروس

✓ حل أسئلة التجميعات السابقة

✓ ملخص لجميع الدروس



للاشتراك

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First Homework for

Introduction to Probability and Statistics (101 Stat)

1) Classify each variable as discrete or continuous and as qualitative or quantitative.

a) The variable that recording the types of trees in the world.

Discrete -Qualitative

b) The variable that recording color of flowers in gardens.

Discrete -Qualitative

c) The variable that recording the lifetime of lamps of a specific brand.

Continuous -Quantitative

d) The variable that recording types of cars in the forest markets in Riyadh.

Discrete -Qualitative

e) The variable that recording numbers of busses in Qaseem.

Discrete -Quantitative

f) The variable that recording colors of the spectrum of rainbow.

Continuous -Qualitative

g) The variable that measures the heights of people.

Continuous -Quantitative

h) The variable that measures the temperature inside classrooms in KSU.

Continuous -Quantitative

2) Give two examples for each of the following (It is not permissible to use the phrases that were written in the previous application):

a) Discrete quantitative variable.

The variable that records numbers of schools in KSA cities

The variable that records numbers of students in universities

b) Continuous quantitative variable.

The variable that records ages of boys in a kindergarten.

The variable that records weights of fruit boxes in a store.

c) Discrete qualitative variable.

The variable that records ID of students in CFY (Common First Year).

. The variable that records colors of pepper in Riyadh markets.

d) Continuous qualitative variable.

The variable that records colors of spectrum of visible light.

. The variable that records of Paint colors in the paint shop

3) Let 7, 20, 8, 6, 7, 8, 8, 9, 6, 9, 5, 4 be given data. Then:

a) Find the **mode(s)** of the given data.

We have one mode $\hat{X} = 8$

b) Calculate the **standard deviation** of given data.

$$\bar{X} = \frac{\sum X_i}{n} = \frac{7 + 20 + 8 + 6 + 7 + 8 + 8 + 9 + 6 + 9 + 5 + 4}{12} = \frac{97}{12} = 8.083$$

$$S^2 = \frac{\sum (X_i - \bar{X})^2}{n - 1} = \frac{(7 - 8.083)^2 + (20 - 8.083)^2 + \dots + (4 - 8.083)^2}{12 - 1} = 16.45$$

$$S = \sqrt{16.45} = 4.06$$

c) Calculate the **standard score** for the value 8.

$$Z_{x_i} = \frac{X_i - \bar{X}}{S}$$

$$Z_8 = \frac{8 - 8.083}{4.06} = -0.02$$

d) Calculate the **coefficient of variation** for the given data.

$$CV = \frac{S}{\bar{X}} \times 100$$

$$CV = \frac{4.06}{8.083} \times 100 = 50.23 \%$$

e) Calculate Q_1 , D_5 , P_{75} , LF and HF for the given data.

x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}	x_{11}	x_{12}
4	5	6	6	7	7	8	8	8	9	9	20

$$q_r = \frac{r(n+1)}{4} \rightarrow q_1 = \frac{1(12+1)}{4} = 3.25$$

$$k = 3, \quad s = 0.25$$

$$Q_r = X_k + s(X_{k+1} - X_k)$$

$$Q_1 = X_3 + 0.25(X_4 - X_3) = 6 + 0.25(6 - 6) = 6$$

$$d_r = \frac{r(n+1)}{10} \Rightarrow d_5 = \frac{5(12+1)}{10} = 6.5$$

$$d_5 = 6.5 \rightarrow k = 6, s = 0.5$$

$$D_r = X_k + s(X_{k+1} - X_k)$$

$$D_5 = X_6 + 0.5(X_7 - X_6)$$

$$D_5 = 7 + 0.5(8 - 7) = 7.5$$

$$P_r = \frac{r(n+1)}{100} \Rightarrow p_{75} = \frac{75(12+1)}{100} = 9.75$$

$$p_{75} = 9.75 \rightarrow k = 9, s = 0.75$$

$$P_r = X_k + s(X_{k+1} - X_k)$$

$$P_{75} = X_9 + 0.75(X_{10} - X_9)$$

$$P_{75} = 8 + 0.75(9 - 8) = 8.75$$

$$Q_1 = 6 \quad , \quad D_5 = Q_2 = 7.5 \quad , \quad P_{75} = Q_3 = 8.75$$

$$LF = Q_1 - 1.5(Q_3 - Q_1)$$

$$LF = 6 - 1.5(8.75 - 6) = 1.875$$

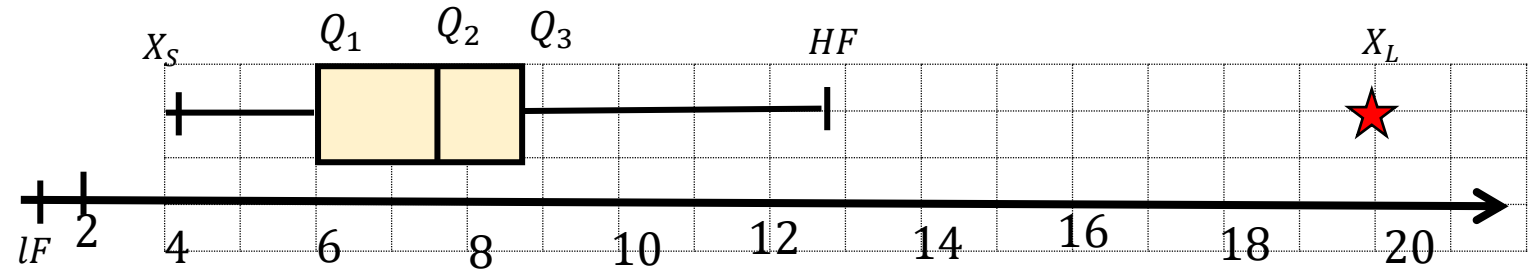
$$HF = Q_3 + 1.5(Q_3 - Q_1)$$

$$HF = 8.75 + 1.5(8.75 - 6) = 12.875$$

X= 20 extreme values

f) Draw the **box plot** for the given data and determine LF , HF and the five numbers on the graph.

$$X_S = 4, Q_1 = 6, Q_2 = 7.5, Q_3 = 8.75, X_L = 20$$

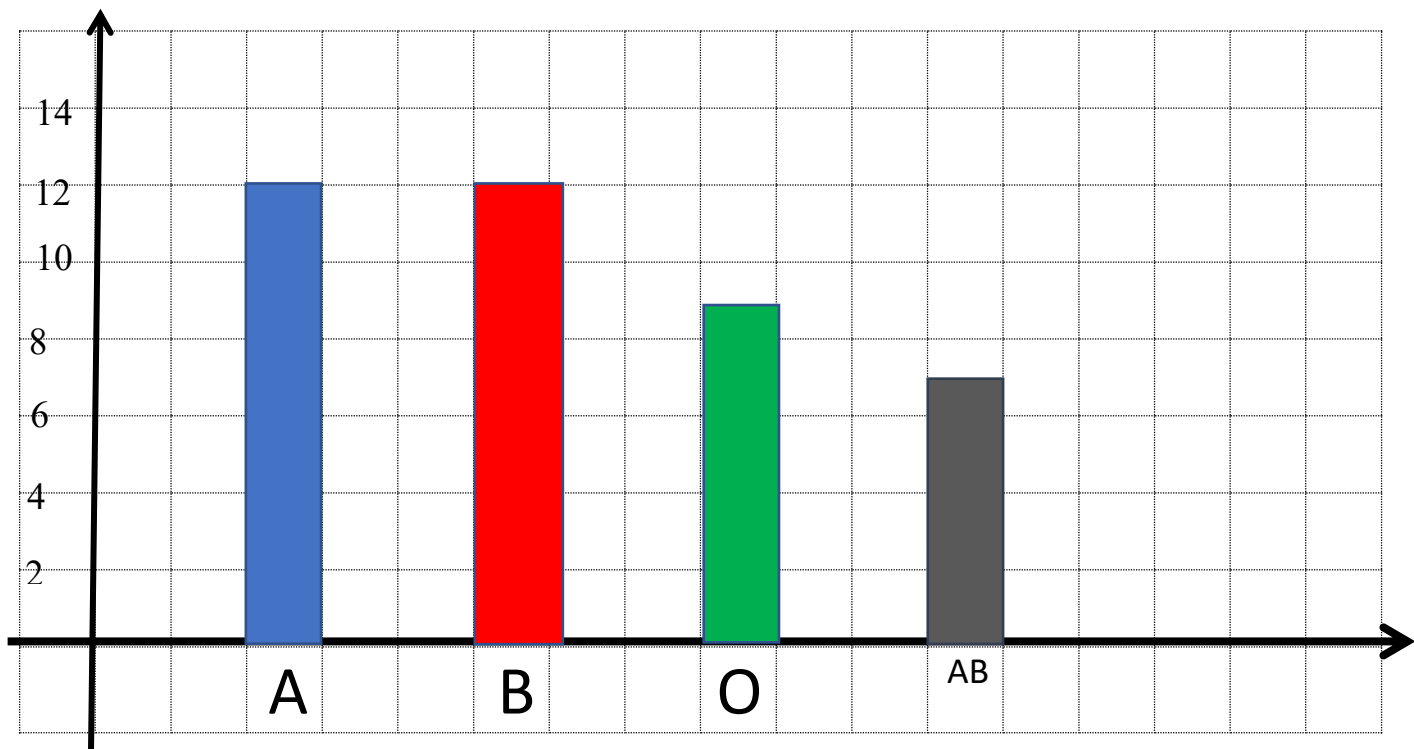


4) Forty students were asked about their blood types (or blood groups). The results were found as follows:

A	A	B	AB	A	B	O	O	O	B
A	B	B	B	O	O	AB	AB	A	A
B	B	B	AB	B	A	A	A	O	O
B	AB	O	AB	B	AB	A	A	O	A

- Construct a **frequency** table for this data.
- Draw the **bar chart** for the given data.
- Draw the **pie chart** for the given data.

Blood types	frequency	Relative frequency	percentage frequency
A	12	0.3	30%
B	12	0.3	30%
o	9	0.225	22.5%
AB	7	0.175	17.5%
Total	40	1	100%

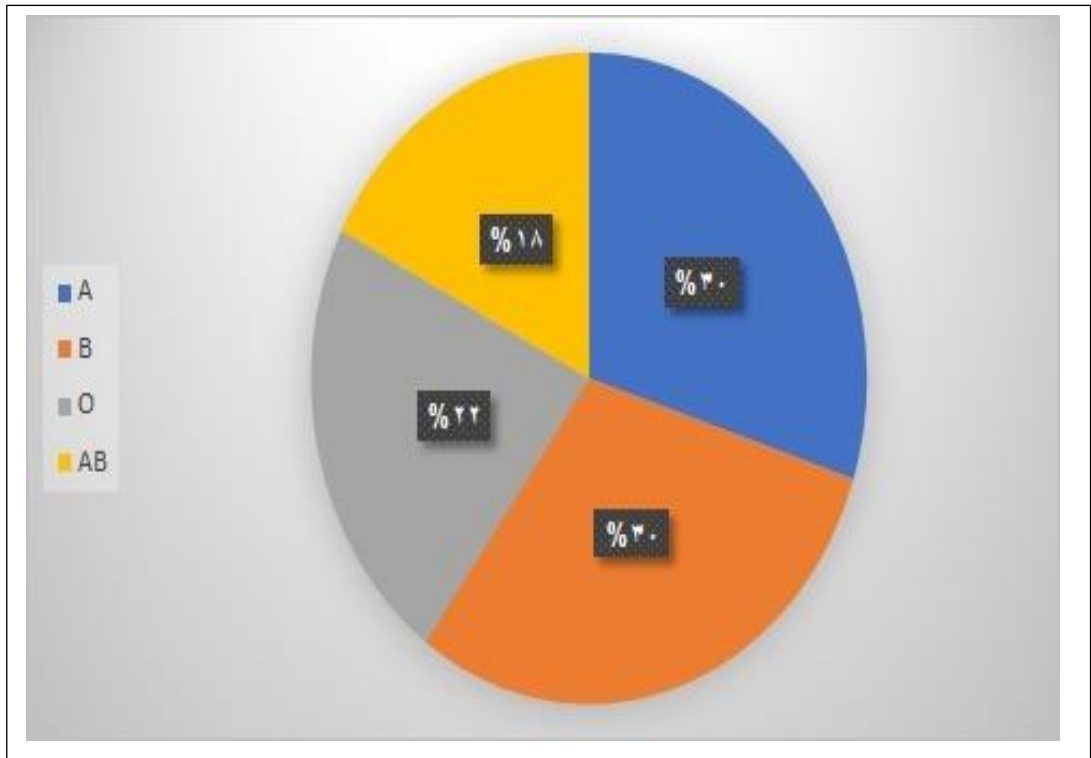


$$m\angle A = \frac{12}{40} \times 360 = 108^\circ$$

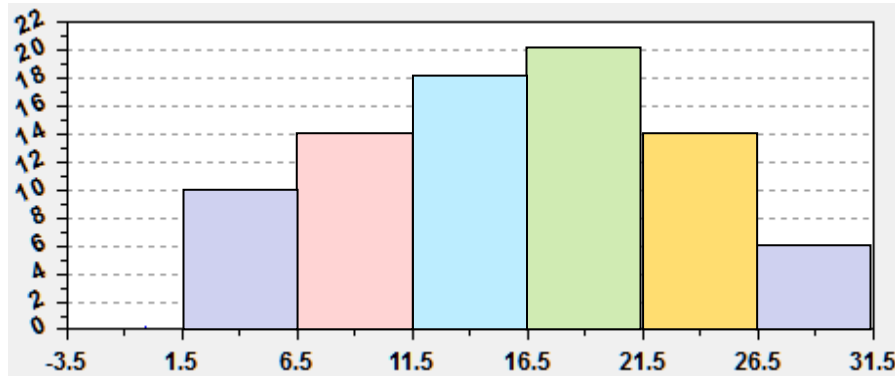
$$m\angle B = \frac{12}{40} \times 360 = 108^\circ$$

$$m\angle C = \frac{9}{40} \times 360 = 81^\circ$$

$$m\angle D = \frac{7}{40} \times 360 = 63^\circ$$



5) Consider the following histogram of grouped data:



- Prepare the **frequency distribution table** for the given data.
- Calculate the **mean, median** and **mode(s)** for the given data.
- Calculate the **standard deviation** for the given data.

Class Limit	Class Boundaries	Class Midpoint	Frequency	Relative frequency	percentage frequency	ACF	DCF
2 – 6	1.5 → 6.5	4	10	0.12	12%	10	82
7 – 11	6.5 → 11.5	9	14	0.17	17%	24	72
12 – 16	11.5 → 16.5	14	18	0.22	22%	42	58
17 – 21	16.5 → 21.5	19	20	0.24	24%	62	40
22 – 26	21.5 → 26.5	24	14	0.17	17%	76	20
27 – 31	26.5 → 31.5	29	6	0.07	7%	82	6
total			82				

1) mean

$$\begin{aligned}\bar{X} &= \frac{\sum x_i f_i}{\sum f_i} \\ &= \frac{(4 \times 10) + (9 \times 14) + (14 \times 18) + (19 \times 20) + (24 \times 14) + (29 \times 6)}{82} \\ &= \frac{1308}{82} = 15.95\end{aligned}$$

2) median

$$\frac{\sum f_i}{2} = \frac{82}{2} = 41$$

$$\begin{aligned}\tilde{X} &= \tilde{L} + \frac{\frac{\sum f_i}{2} - (\tilde{F} - \tilde{f})}{\tilde{f}} \times C \\ \tilde{X} &= 11.5 + \frac{41 - (42 - 18)}{18} \times 5 = 16.22\end{aligned}$$

3) mode:

$$d_1 = 20 - 18 = 2, \quad d_2 = 20 - 14 = 6$$

$$\widehat{X}_1 = \widehat{L} + \frac{d_1}{d_1 + d_2} \times C$$

$$\widehat{X}_1 = 16.5 + \frac{2}{2 + 6} \times 5 = 17.75$$

1) variance

Class Boundaries	x_i	f_i	$(x_i - \bar{x})$	$(x_i - \bar{x})^2$	$f_i(x_i - \bar{x})^2$
1.5 → 6.5	4	10	-11.95	142.80	1428.03
6.5 → 11.5	9	14	-6.95	48.30	676.24
11.5 → 16.5	14	18	-1.95	3.80	68.45
16.5 → 21.5	19	20	3.05	9.30	186.05
21.5 → 26.5	24	14	8.05	64.80	907.24
26.5 → 31.5	29	6	13.05	170.30	1021.82
total		82			4288.1

$$S^2 = \frac{\sum f_i(x_i - \bar{x})^2}{\sum f_i - 1}$$
$$= \frac{4288.1}{82 - 1} = 52.94$$

2) standard deviation

$$S = \sqrt{4288.1} = 7.28$$

6) Consider data given by the following frequency distribution table:

Class Limit	Class Boundaries	Midpoint	Frequency	Relative Frequency	Percentage Frequency	ACF	DCF
2 – 6			6				50
	6.5 → 11.5			0.24			
		14			18 %		
	16.5 → 21.5					42	
22 – 26			8				
Sum							

- a) Complete the above frequency distribution table.
 b) How many mode(s) have the data of the above frequency distribution table? Calculate it (them).
 c) Calculate the variance for the given data.
 d) Draw ogives of the above frequency distribution table.

Class Limit	Class Boundaries	Class Midpoint	Frequency	Relative frequency	percentage frequency	ACF	DCF
2 – 6	1.5 → 6.5	4	6	0.12	12%	6	50
7 – 11	6.5 → 11.5	9	12	0.24	24%	18	44
12 – 16	11.5 → 16.5	14	9	0.18	18%	27	32
17 – 21	16.5 → 21.5	19	15	0.30	30%	42	23
22 – 26	21.5 → 26.5	24	8	0.16	16%	50	8
Sum			50	1	100%		

b) We have tow Modes

$$\widehat{X}_1 = L + \frac{d_1}{d_1 + d_2} \times C$$

$$\widehat{X}_1 = 6.5 + \frac{6}{6 + 3} \times 5 = 9.83$$

$$\widehat{X}_2 = L + \frac{d_1}{d_1 + d_2} \times C$$

$$\widehat{X}_2 = 16.5 + \frac{6}{6 + 7} \times 5 = 18.81$$

c) mean

$$\begin{aligned}\bar{X} &= \frac{\sum x_i f_i}{\sum f_i} \\ &= \frac{(4 \times 6) + (9 \times 12) + (14 \times 9) + (19 \times 15) + (24 \times 8)}{50} \\ &= \frac{735}{50} = 14.7\end{aligned}$$

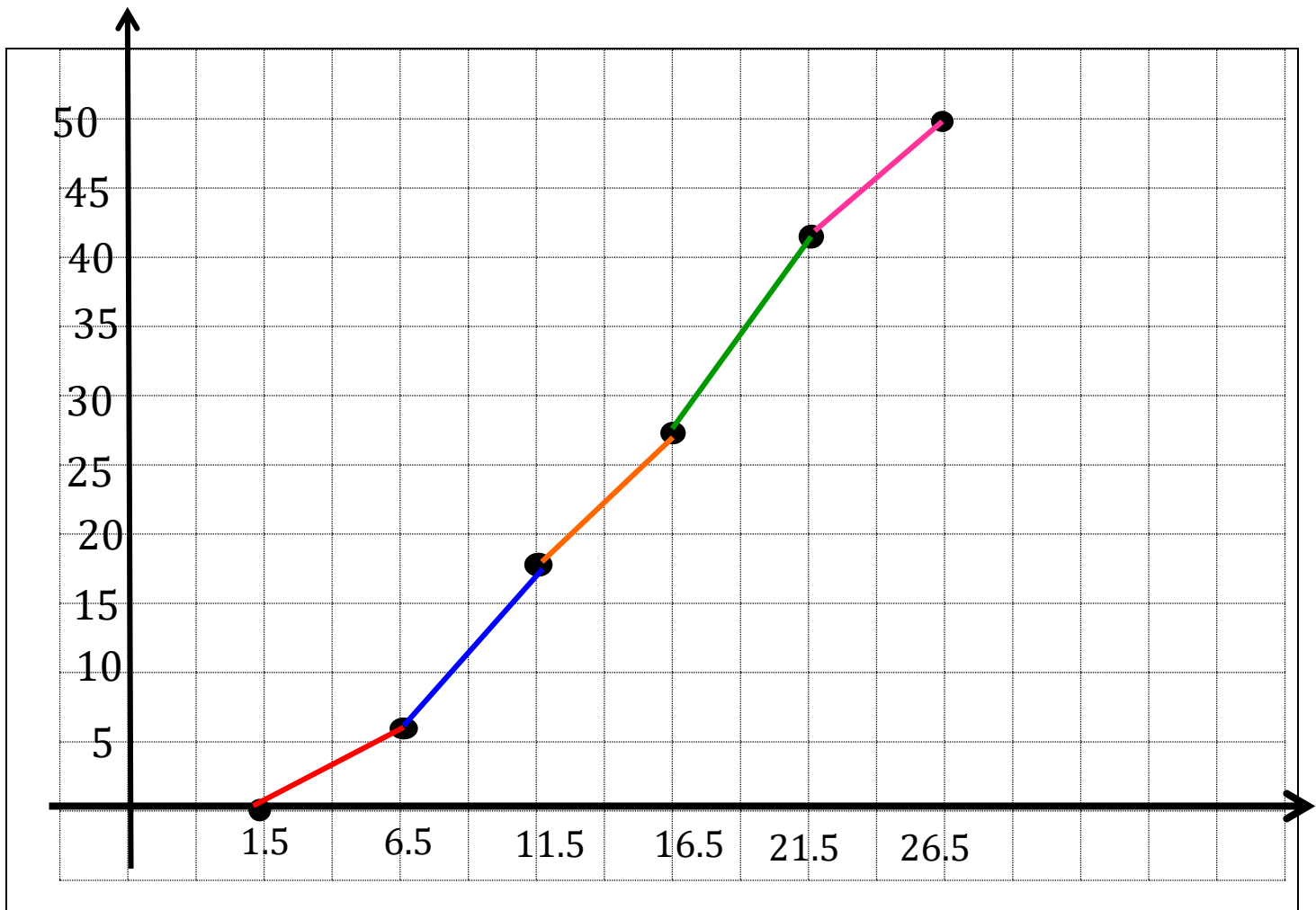
variance

Class Boundaries	x_i	f_i	$(x_i - \bar{x})$	$(x_i - \bar{x})^2$	$f_i(x_i - \bar{x})^2$
1.5 → 6.5	4	6	-10.7	114.49	686.94
6.5 → 11.5	9	12	-5.7	32.49	389.88
11.5 → 16.5	14	9	-0.7	0.49	4.41
16.5 → 21.5	19	15	4.3	18.49	277.35
21.5 → 26.5	24	8	9.3	86.49	691.92
total		50			2050.5

$$S^2 = \frac{\sum f_i (x_i - \bar{x})^2}{\sum f_i - 1}$$
$$= \frac{2050.5}{50 - 1} = 41.85$$

standard deviation

$$S = \sqrt{41.85} = 6.47$$

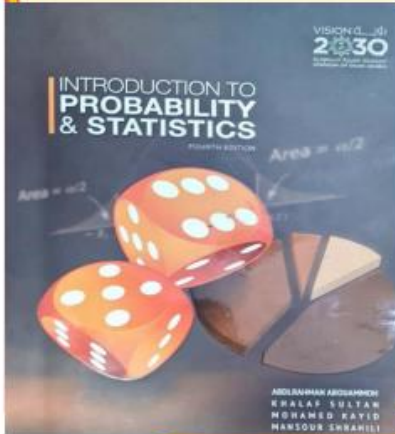


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✓ حل أسئلة التجميعات السابقة

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دورات اون لاين

بدأ التسجيل في دورات اون لاين لشرح مناهج السنه الأولى المشتركة



كمي 207
رياض 106
رياض 107



حصص مكثفه و قبل الاختبار - حل نماذج اختبارات - متابعة مستمرة - ملخص لكل الدروس
الشرح اون لاين علي برنامج الزوم حصتين بالاسبوع للاشتراك 0551807200

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