

# Statistics

## ASSIGNMENT

### Unit 3

name of student.....

name of teacher .....

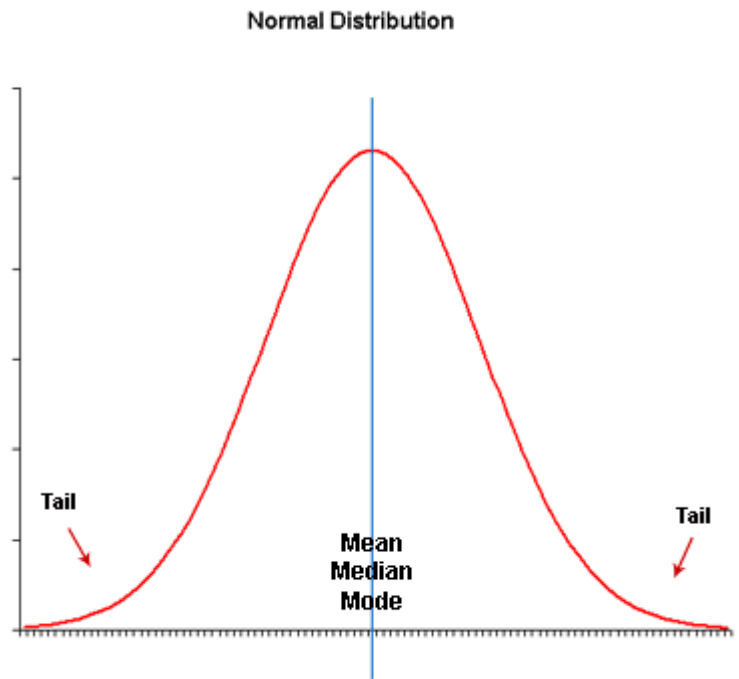
Date	ASGMT	Questions for Completion	Areas for Improvement
	<b>1</b> Stats		
	<b>2</b> Stats		
Evaluation:			
	<b>3</b> Stats		
	<b>4</b> Stats		
Evaluation:			
	<b>5</b> Stats		
	<b>6</b> Stats		
Evaluation:			
	<b>7</b> Stats		
	<b>8</b> Stats		
Evaluation:			

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ASGMT <b>1</b> Stats	
ASGMT <b>2</b> Stats	
<b>Test 1</b>	
ASGMT <b>3</b> Stats	
ASGMT <b>4</b> Stats	
<b>Test 2</b>	
ASGMT <b>5</b> Stats	
ASGMT <b>6</b> Stats	
<b>Test 3</b>	
ASGMT <b>7</b> Stats	
ASGMT <b>8</b> Stats	
<b>Test 4</b>	
ASGMT <b>9</b> Stats	
ASGMT <b>10</b> Stats	
ASGMT <b>11</b> Stats	



Summary of Data

Assignment 4 Stats



Calculator allowed

You must show all **working**

Total marks for the paper - **100**

# Mean & Standard Deviation

## Q1

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(Ex. 3F, 3, a)

In tenpin bowling the player attempts to knock down all ten skittles with one ball. If all ten are knocked down the player's turn ends without a second ball being bowled but if any skittles are left standing the player attempts to knock them down with a second ball. After the second ball the player's turn ends even if some skittles remain standing.

A novice player bowls a total of 34 balls. The numbers of skittles knocked down per ball are as follows.

<b>Number of skittles</b>	0	1	2	3	4	5	6	7	8	9	10
<b>Frequency</b>	6	3	1	7	8	3	2	3	0	1	0

a) Giving the formulae for variance and/or standard deviation:

$$\sigma^2 = \qquad \qquad \qquad \sigma = \qquad \qquad \qquad (3)$$

b) use your calculator to determine the mean and standard deviation of the numbers of skittles knocked down per ball. (7)

$$\bar{x} =$$

$$\sigma =$$

(Total 10 marks)

Q1

**Q2**

Leave  
blank

(Ex. 3D, 5)

For a data set of 50 items of data  $\sum (x - \bar{x})^2 f = 8$  and  $\sum xf = 20$ .

a) Giving the formulae for variance and/or standard deviation that you are going to use :

$$\sigma^2 = \qquad \qquad \qquad \sigma = \qquad \qquad \qquad (3)$$

b) find the mean and standard deviation of the data. (7)

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$$\bar{x} =$$

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$$\sigma =$$

(Total 10 marks)

**Q2**

## Comparing Standard Deviation & Evaluation of Outliers

### Q3

(Ex. 3D, 3)

Steve Race and Roy Bull are football players. In the 30 games played so far this season their scoring record is as follows.

<b>Goals scored</b>	0	1	2	3	4
<b>Frequency (Steve)</b>	12	8	8	1	1
<b>(Roy)</b>	4	21	5	0	0

a) Giving the formulae for variance and/or standard deviation that you are going to use :

$$\sigma^2 = \qquad \qquad \qquad \sigma = \qquad \qquad \qquad (3)$$

b) find the mean and standard deviation of the number of goals each player scored.

Steve (7)

$$\bar{x} =$$

$$\sigma = \qquad \qquad \qquad (7)$$

Roy

$$\bar{x} =$$

$$\sigma =$$

c) Comment on the player's goal scoring records (3)

(Total 20 marks)

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**Q3**

**Q4**

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(Ex. 3D, 9)

A farmer expects to harvest a crop of 3.8 tonnes, on average, from each hector of his land, with standard deviation 0.2 tonnes.

One year there was much more rain than usual and he harvested 4.1 tonnes per hector.

a) Was this exceptional? **(2)**

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b) Give a reason to your answer to a) using criteria for an outlier based on standard deviation. **(6)**

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c) Do you think the crop was affected by the unusual weather or was the higher yield part of the variability which always occurs? **(2)**

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(Total **10** marks)

**Q4**

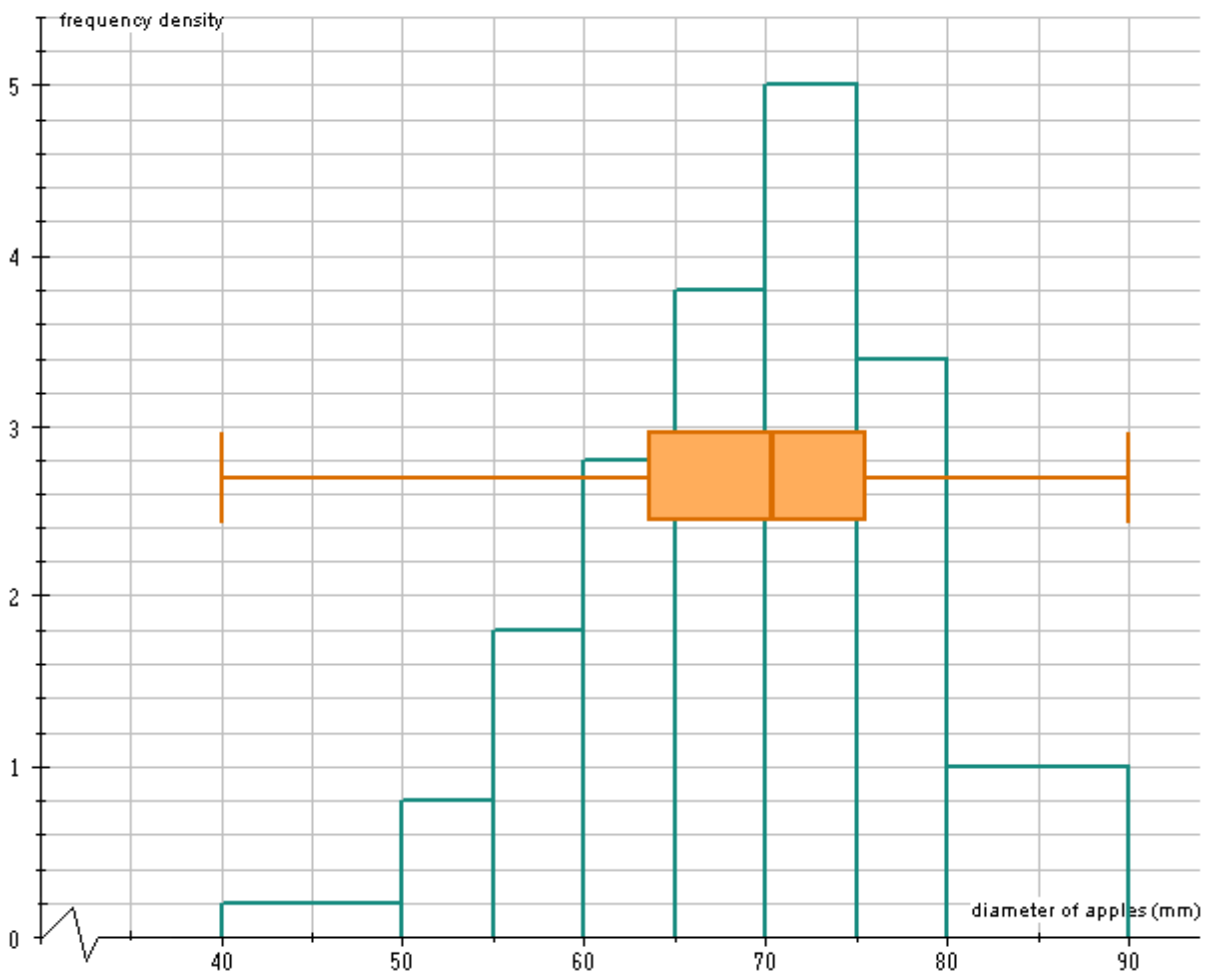
**Q5**

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(Ex. 3F, 8)

A farmer gathers apples from his orchard. The apples are graded according to their diameter measured in millimetres.

The diagram shows the distribution of diameters of a sample of the apples. The scale on the vertical axis represents the frequency density (that is, frequency per mm).



a) How many apples are there in the modal class? (3)

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b) Show that the sample contains 100 apples. (5)

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c) Calculate an estimate of the mean diameter of apples in the sample. Explain why your answer is only an estimate. (5)

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d) Given a box and whisker plot, above, describe the shape of the distribution of the data in terms of median. What is the range and interquartile range of the data? (5)

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e) The standard deviation is approximately 9 mm. State, with reasons, number of apples you regard as outliers. (7)

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(Total 25 marks)





