Mathematics Department

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Course Methods Year 12 test four 2022

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ssk weighting:	% 0l [_]	
Marks available:	44 marks	
smeđi leizedć:	Drawing inst doublesided	ruments, templates, one page of A4 notes
:sməti brabnas		« preferred), pencils (including coloured), ection fluid/tape, eraser, ruler, highlighters ———————————————————————————————————
Materials required:	Upto 3 calc	ulators/classpads allowed
umber of questions	9:	_
ime allowed for thiz	task:40	suim —
լցsk type:	Kesbouse	
etudent name:		Теасһег пате:

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Note: All part questions worth more than 2 marks require working to obtain full marks.	, N
Formula sheet provided: Yes	4

Mathematics Department	Perth Modern
Q1 (4 marks) 4.2.5 The exam results, out of a 100, for a Methods exam at a particular school was found to Distributed. It was found that 21% of the students scored a result greater than 85 and 17 mark less than 55. Determine the mean and standard deviation.	
Q2 (2, 2, 3 & 2 = 9 marks) 4.3.8 A 95% confidence interval was determined for the proportion of faulty factory parts made company. The interval length is 0.106 and the sample size is 200. Determine the expected length of the interval for each change in isolation to 3 decimal	
a) A sample size of 300 was used.	
a) A sample size of 600 was asea.	
b) A 90% confidence was used.	
b) A 30% confidence was used.	
a) An OOM confidence AND a completion of 150 was used	
c) An 88% confidence AND a sample size of 150 was used.	
d) The true proportion of faulty parts does not lie in the stated interval. Does this su	ggest a
sampling error was made? Justify.	JJ

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Q3 (2, 2, 2, 3, 3, 3 & 3 = 18 marks) 4.2.5, 4.2.3, 3.3.1, 3.3.6, 3.3.7 A parcel making factory makes boxes of the same width and heights but the lengths vary and are found to be Normally Distributed with a mean of 135 mm and a standard deviation of 27 mm.

s) Determine the percentage of boxes that are longer than 166mm.

The boxes can be classified as the following.

	974.0	760.0		Probability
Greater than 140mm	100 to 140 mm	mm 001 ot 24	mm 24 of 0	Гength
Gigantic	Very Long	риод	Short	Box

- b) Complete the missing probabilities in the above table.
- c) Comment on the appropriateness of the Normal Model for the lengths of the boxes.

- d) If 30 boxes were taken off the assembly line, determine the probability that exactly 13 were gigantic lengths.
- e) Determine the probability that it would take 20 boxes in a row off the assembly line before 8 gigantic boxes were found.

Continued on next page

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Working out space

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Q3 cont

If the costs of each box were determined as follows.

Во	X	short	long	Very long	gigantic
Co	st \$	\$3.21	\$4.12	\$5.20	\$6.30

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i)	Determine the mean of	cost to two decimal	places. Show all	working.
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ii)	Dotormino tho	ctandard d	oviotion to	two docimal	places (Show all working.

Q4 (3, 2, 3, 3 & 2 =13 marks) 4.3.4, 4.3.5, 4.3.6, 4.3.9, 4.3.10 In Australia it has been found that 16% of people are left-handed. Samples of people are surveyed to

In Australia it has been found that 16% of people are left-handed. Samples of people are surveyed to ascertain the proportion that are left-handed. Let \hat{p} denote the proportion of people in the sample who are left handed.

a) State the approximate distribution of \hat{p} for sample sizes of 100.

b) Determine the approximate probability that in a sample of 300 people that the proportion of left handed people is greater than 0.21.

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Q4 cont-

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In a recent survey it was found that 18 people out of a sample of 200 were left handed.

c) For a 99% confidence interval, what is the margin of error based on this recent sample of 200?

d) Determine a 95% confidence interval based on the recent sample of 200 people.

e) Does the recent sample support the assumed proportion of 16% for left handed people?
 Explain.