Assessment Schedule – 2025

Mathematics and Statistics: Interpret and apply mathematical and statistical information in context (91946)

Evidence

Q	Evidence	Achievement	Achievement with Merit	Achievement with Excellence
ONE (a)	$\dfrac{6}{126} = 0.0476 = 4.76\,\%$	• Correct answer.		
(b)	**Centre**: We can see that the median cost of Nike shoes is $234 and the median cost of Adidas shoes $131. This means typically that Nike shoes cost more than Adidas shoes. Or by similar description using the means ($255.90 greater than $158.39). **Shift** Nike's middle 50% box for cost of shoes has been shifted slightly to the right of Adidas's middle 50% box. There is no overlap between the two boxes (Adidas UQ = $171 and Nike LQ = $183). This supports the conclusion that Nike shoes tend to be more expensive than Adidas shoes. **Shape** Both Nike shoes and Adidas distributions for costs of shoes are right-skewed. Most of the data is bunched towards the left-hand side, but with a few outliers pulling the tail to the right. **Spread** The spread for the costs of Nike shoes is $810 (900 – 90) and the spread for the costs of Adidas shoes is $639 (702 – 63). This means that there is more variation in the cost of Nike shoes than in Adidas shoes. OR The IQR for the cost of Adidas shoes is $77 (171 – 94), and the IQR for the costs of Nike shoes is $115 (298 – 183). This means that there is more variation in the cost of the middle 50% of the Nike shoes compared to Adidas shoes. **Conclusion** As there is no overlap of the middle 50% (IQR) of each group we can support the claim that Nike tends to be more expensive than Adidas for sports shoes. OR Using DBM / OVS reasoning. I can make this claim because in this sample 1/5 of the OVS (204/5 = 40.8) is not greater than the DBM (103). DBM / OVS = 0.5 is > 0.2	• One feature described in context. OR Correct conclusion.	• Two features described in context. OR One feature described in context. AND Correct conclusion, with valid justification that Nike shoes tend to be expensive.	• TWO features described in context. AND Correct conclusion, with valid justification that Nike shoes tend to be more expensive.

(c)	This data has only come from one website. There is a large number of sports-shoe websites with a wide variety in the cost of sports shoes, so we would need to be careful, as this website might not represent all websites' prices. We don't know if this was including sale prices, or just the RRP. This could mislead people on the cost of shoes, as it could be showing a cheaper price than what the price actually is. This website is based in NZ for women; it does not give us information about anywhere else.	• One reason stated.	• One reason stated. AND With justification.	
(d)	• We can see that the long-term trend of the amount of spending is steadily increasing from approximately $NZ790 million in 2010 to $NZ1100 million in 2024. This could be because the population of New Zealand is increasing and prices are rising, as this is the total amount spent and not the average amount spent per person. • There seems to be a repeating pattern. Spending looks like it peaks in Quarter 4, when it is close to Christmas. Spending is likely to increase then because of buying presents and spending in readiness for the summer holidays. • In 2017 Q2 there is an unusual peak in spending up to over $1400 million. • In 2021, there appears to be a dip in the amount of money being spent on clothing and footwear. This could be because of the Covid pandemic, which led to the population spending less in lockdowns. • The peak and trough amount difference seems to be increasing as the years progress.	• One valid statement using a feature of time series.	• Two valid statements using features of time series. OR One valid statement using a feature of time series. AND Explains using reasoning as to why we might be seeing this. (Contextual knowledge / personal worldviews	• Two valid statements using features of time series, with numerical supporting evidence. AND Explains these using reasoning as to why we might be seeing this. (Contextual knowledge / personal worldviews.)
(e)	I predict that in the future the amount of spending on clothes and shoes will continue to rise. This follows the long-term trend, and because the trend has been generally consistent since 2010. I would be reasonably confident with this prediction for the next few years, but no one knows what will happen many years into the future. There was also a dip in 2024, which may forecast a future fall in total amount of money spent. Accept valid justified comments to predict that spending will decrease.	• Valid comment regarding future predictions made.	• Valid comment regarding future predictions made. AND Justifies how confident they would be with the predictions for the next few years.	

NØ	N1	N2	A3	A4	M5	M6	E7	E8
No response; no relevant evidence.	ONE question attempted towards solution.	1u	2u	3u	1r	2r	t1	t2

Q	Evidence	Achievement	Achievement with Merit	Achievement with Excellence
TWO (a)	We can see that there is a positive linear relationship: as the size of the shoe increases, so does the price of the shoe. The relationship appears to be of moderate / weak strength, as there is a bit of scatter either side of the trend line. There appears to be two groups of prices. One group goes from size 1 to size 6, and the other group is from size 7 to size 10. This could be due to the two groups of adults' and children's shoes. There is an unusual result of shoe size 6 that cost $150, which is much more expensive than the other shoes of this size.	• One feature described in context.	Two features, described in context.	• Two features, described in context.
(b)	The trend line gives a prediction of $65 (accept $64–66). Accept use of correctly calculated values for median and / or mean. I would be hesitant with predictions of the cost of size 6 (or size 11) shoes, because data points lie below the line of best fit, so estimates will be too large. Generally, not confident as there is a lot of variation of prices for each shoe size. The relationship is not strong	• Correct answer.		AND Discussion on how confident you would be predicting size 6.

(c)				
	Football Direct for **one** pair of shoes: Shoe cost = 68 × 1.15 = 78.20 including GST Actual cost = 78.20 + 6.66 = $84.86 *Footy Fields* for **one** pair of shoes : Shoe cost = 90 × 0.95 = 85.50 after discount After "no GST" deal = $\dfrac{85.50}{1.15}$ = 74.35 Actual cost = 74.35 + 5.99 = $80.34 *Kick Off* for **one** pair of shoes: Shoe cost = 70 × 1.15 = 80.50 including GST Actual cost = 80.50 + 4 = $84.50 OR only $80.50 if collecting from factory *Football Direct* for **two** pairs of shoes: Shoe cost = 68 × 1.15 = 78.20 including GST Actual cost = 78.20 × 2 = $156.40 *Footy Fields* for **two** pairs of shoes: Shoe cost = 180 × 0.90 = 162 after discount After "no GST" deal = $\dfrac{162}{1.15}$ = 140.87 Actual cost = 140.87 + 5.99 = $146.86 *Kick Off* for **two** pairs of shoes : Shoe cost = 70 + 35 = 105 After GST = 105 × 1.15 = 120.75 Actual cost = 120.75 + 4 = $124.75 OR only $120.75 if collecting from factory We can see that if Ricky was to buy one pair of shoes, his best choice would to be buy through *Footy Fields* with a price of $80.34. However, we can see that if Ricky was to buy two pairs of shoes, then his best choice would to be buy through *Kick Off* with a price of $124.75. Examples of "personal world views" could include: • Is it necessary to buy shoes with a trendy name if their quality is no better? • Why buy two pairs of football boots? • If shipping is only $4 maybe more convenient to post rather than bus or drive? • Is the quality of the shoes comparable as you can't check on the internet? Accept any sensible comments.	• Calculates the cost of one or two pairs of shoes from ONE company with communication.	• Calculates the cost of one or two pairs of shoes from TWO companies with communication.	• Calculates the cost of ALL THREE companies, with clear evidence of working and communication, for purchasing one OR two pairs of shoes. AND Provides justified recommendations of which company would be the best. AND Considers "personal world views".

| (d) | Resource 2A shows that the cost of shoes generally tends to increase as the size of shoes increases. This means that Ricky's next pair of shoes is likely to cost more than what he has paid previously. Resource 2B states that the special offers only apply to show sizes 1–7 for all 3 companies. Could show cost of shoes for each company without any of the offers. *Kick Off* is still likely to be the best deals as their shipping costs are cheaper or have no cost. | • Comments on increasing trend as sizes go up so therefore the next pair of sports shoes will cost Ricky more.
OR
Makes a recommendation for Ricky with reasons to justify the decision.
OR
Uses Resource 2A to find a potential cost of $80 for size 8. | • Comments on increasing trend as sizes go up so therefore the next pair of shoes will cost Ricky more.
AND
Reasons to justify the decision that Ricky should use the *Kick Off* deal which would save him money. | |

NØ	N1	N2	A3	A4	M5	M6	E7	E8
No response; no relevant evidence.	ONE question attempted towards solution.	1u	2u	3u	1r	2r	t1	t2

Q	Evidence	Achievement	Achievement with Merit	Achievement with Excellence
THREE (a)	2571 × 53% who run in the morning = 1362.63 runners. I.e. approx. 1362 (or 1363) runners.	• Correct answer.		
(b)	We can see that Asics appears to be the most popular brand of running shoes, with 22% of survey participants saying that they preferred the Asics make. This is followed closely by Nike on 20% and Adidas on 19%. The survey percentages are actually very close to each other, and range from 17% to 22%, so there is no clear winner as to which is actually the most popular running shoe, especially as 14% said that they did not have a favourite and 8% said they prefer other makes. Good sample size. Could use other graphs to support lack of confidence.	• Identify Asics with justification.	• Identify Asics with justification. AND Justifies how confident you would be in the most popular.	
(c)	Comments must reference age – some examples are: • We can see that for all ages, the most popular shoe is Nike, with percentages varying between 24% and 46% of the runners, although Asics is reasonably close for ages greater than 31 years old. • Asics has a much smaller popularity of only 8% of the market for the under 20 years old compared to the older age groups. • There are quite high percentages of runners that don't seem to have a particular brand preference with between 10% and 18% of the runners undecided. • In the over 60 years age group, Adidas, Nike, and Asics have very similar percentages of the runners. • Accept other valid similarities or differences. Quinn is in the age bracket of 31–40 years old (31 years old) where the most common brand of running shoe are Nike and Asics, both with 24%. Both of these brands are 5% higher than Adidas. Quinn might therefore go with either of these popular brands. However, his age is only just inside this age bracket, so perhaps he would still be thinking like a 29 year old person, where Nike is the most popular brand. But, then again, Quinn might not be concerned by the brand and label, but other factors like style, comfort, durability, etc.	• ONE similarity or difference about most popular shoes linked to age. OR Clearly justified recommendation of what Quinn might do.	• TWO similarities or differences about most popular shoes linked to age. OR One similarity or difference about most popular shoes linked to age. AND Clearly justified recommendation of what Quinn might do.	• TWO similarities or difference about most popular shoes linked to age. AND Clearly justified recommendation of what Quinn might do.

(d)	Comments must refer to at least two pieces of evidence provided in Resource 3. Examples are: • As Axel is 45 years old, he is, likely to be choosing Nike or Asics shoes, which are the most popular brands for that age group. But, as Axel is running approximately 50 km per week, the most popular shoe brand is Asics (24%), but only slightly more than Nike (22%). If he wants to buy the brand worn by others similar to him, then he should choose Asics. But only 7% consider the brand when buying a new pair of shoes. • Resource1A says that Nike shoes will cost, on average, about $234 – he is likely to pay about $200. • Resource 2A seems to suggest that size 9 shoes are likely to be cheaper than (approximately) $80. Maybe Resource 2A does not include many of the higher quality shoes. • Resource 3 tells us that approximately half of runners pay between $80 and $120. Accept other valid comments.	• Basic comment on TWO pieces of evidence from Resource 3 graphs.	• Links both the distance and age bracket to **recommend** a shoe.	• Links both the distance and age bracket to recommend a shoe. AND Uses a price guide to help suggest how much he might need to **pay**, with justification. Needs to state which resource used.
(e)	This survey has the opinions of 2571 people on shoe buying. This is a reasonable amount, but we don't know the details of the numbers in each age group who has actually answered it. In order to be more confident, we would need to know the number of different ages, as if there was an uneven amount of the different ages, it could heavily impact the results and it might not be entirely reliable. *Allow other valid acceptable reasons.* *E.g. some people may have completed the survey several times.* *E.g. the sampling / surveying method may not be representative.* *E.g. Information from only one website.*	• Identifies that 2571 is an acceptable sample size of people to ask.	• Justifies why we need to be cautious about using the results.	

NØ	N1	N2	A3	A4	M5	M6	E7	E8
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Cut Scores

Not Achieved	Achievement	Achievement with Merit	Achievement with Excellence
0–6	7–12	13–18	19–24