**Stage 1 General Mathematics**

**Assessment Type 2: Mathematical Investigation**

**Topic 1: Investing and Borrowing – Personal Loan for a Car**

A friend has approached you wanting some advice on taking out a personal loan for a car. They want to buy a car that costs between $15 000 and $25 000. They need you to provide them with as much information as possible to assist them in making a decision about taking out the loan.

They haven’t got a graphics calculator so you need to investigate the kind of information that is available on the internet for them to access. You should cover ***at least three*** of these sites in detail. You will then create a report on your investigations for your friend.

**Part 1: Important Terms Summary**

You quickly realise that there are some important *terms* that your friend will need to understand when deciding on a loan. Some *terms* you need to consider are listed below, but if you find other terms that are important include them in your ***Important Terms Summary***. Provide a brief explanation for your friend of what each of these *terms* mean, and why they are important to know when considering a personal loan.

Fixed rate Variable rate

Secured loan Unsecured loan

Fixed repayments Additional repayments

**Part 2: Make a prediction about which may be the better type of loan**

From your knowledge of the different types of loans (fixed rate, variable rate, secured loan and unsecured loan), predict which of these will provide your friend with the cheapest loan when repaying their car.

**Part 3: Select a car**

Select a car that is within the price range that your friend is considering. All of your mathematical calculations will be based on the price of this car. Include a copy of the advertisement in your appendices. (*Spend minimal time finding this information*).

**Part 4: Information and mathematical calculation summary for 3 internet sites**

For ***each of the internet sites*** you identify to share with your friend, create an information page/s that include the following:

1. A hyperlink to the ***internet site*** so that your friend can easily access it.
2. Information about any costs associated with the loan beyond the regular repayments on the loan (e.g. Loan Establishment fees, Personal Properties Securities Registration etc). You will need to do this for each different type of loan that you investigate through this internet site.

**Part 4: continued**

1. Mathematical calculations for ***at least four*** different loan scenarios showing the ***total cost of the loan*** and the ***total interest*** that your friend will need to pay using the price of the car you chose in Part 2 (using information from the loan calculator available on the site). **Full calculations** should be shown even if the loan calculator determines the cost of the loan and the total interest charged for you.

Things you should consider in your calculation scenarios are:

* Timing of the repayments (weekly, fortnightly, monthly)
* The type of loan (secured, variable rate, fixed rate)
* The length of the loan
* Additional fees and charges.
1. Make a recommendation about which of the loan scenarios you investigated from ***this internet site*** your friend should consider when making their final choice. Discuss any assumptions you have made in making this recommendation or any limitations to the information you could access that may affect the reasonableness of your recommendation.

**Part 5: Conclusion**

Drawing on the *information and mathematical calculation summaries* of the loans available on the internet sites you have investigated, recommend the most appropriate loan for your friend to take out. Is the loan type that you predicted in Part 2 the best loan option for your friend? Why? Why not?

**Your report on the mathematical investigation should include the following:**

* an introduction outlining the task
* the responses for Part 1 through to Part 4
* conclusions in the context of the problem
* a bibliography and appendices, as appropriate.

The format of an investigation report may be written or multimodal.

The investigation report should be a **maximum of 8 pages** if written, or the equivalent in multimodal form.

Performance Standards for Stage 1 General Mathematics

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|  | Concepts and Techniques | Reasoning and Communication  |
| **A** | Comprehensive knowledge and understanding of concepts and relationships.Highly effective selection and application of mathematical techniques and algorithms to find efficient and accurate solutions to routine and complex problems in a variety of contexts.Successful development and application of mathematical models to find concise and accurate solutions.Appropriate and effective use of electronic technology to find accurate solutions to routine and complex problems. | Comprehensive interpretation of mathematical results in the context of the problem. Drawing logical conclusions from mathematical results, with a comprehensive understanding of their reasonableness and limitations.Proficient and accurate use of appropriate mathematical notation, representations, and terminology.Highly effective communication of mathematical ideas and reasoning to develop logical and concise arguments.Formation and testing of appropriate predictions, using sound mathematical evidence. |
| **B** | Some depth of knowledge and understanding of concepts and relationships.Mostly effective selection and application of mathematical techniques and algorithms to find mostly accurate solutions to routine and some complex problems in a variety of contexts.Attempted development and successful application of mathematical models to find mostly accurate solutions.Mostly appropriate and effective use of electronic technology to find mostly accurate solutions to routine and some complex problems. | Mostly appropriate interpretation of mathematical results in the context of the problem.Drawing mostly logical conclusions from mathematical results, with some depth of understanding of their reasonableness and limitations.Mostly accurate use of appropriate mathematical notation, representations, and terminology.Mostly effective communication of mathematical ideas and reasoning to develop mostly logical arguments.Formation and testing of mostly appropriate predictions, using some mathematical evidence. |
| **C** | Generally competent knowledge and understanding of concepts and relationships.Generally effective selection and application of mathematical techniques and algorithms to find mostly accurate solutions to routine problems in different contexts.Application of mathematical models to find generally accurate solutions.Generally appropriate and effective use of electronic technology to find mostly accurate solutions to routine problems. | Generally appropriate interpretation of mathematical results in the context of the problem.Drawing some logical conclusions from mathematical results, with some understanding of their reasonableness and limitations.Generally appropriate use of mathematical notation, representations, and terminology, with reasonable accuracy.Generally effective communication of mathematical ideas and reasoning to develop some logical arguments.Formation of an appropriate prediction and some attempt to test it using mathematical evidence. |
| **D** | Basic knowledge and some understanding of concepts and relationships.Some selection and application of mathematical techniques and algorithms to find some accurate solutions to routine problems in context.Some application of mathematical models to find some accurate or partially accurate solutions.Some appropriate use of electronic technology to find some accurate solutions to routine problems. | Some interpretation of mathematical results.Drawing some conclusions from mathematical results, with some awareness of their reasonableness.Some appropriate use of mathematical notation, representations, and terminology, with some accuracy.Some communication of mathematical ideas, with attempted reasoning and/or arguments.Attempted formation of a prediction with limited attempt to test it using mathematical evidence. |
| **E** | Limited knowledge or understanding of concepts and relationships.Attempted selection and limited application of mathematical techniques or algorithms, with limited accuracy in solving routine problems.Attempted application of mathematical models, with limited accuracy.Attempted use of electronic technology, with limited accuracy in solving routine problems. | Limited interpretation of mathematical results.Limited understanding of the meaning of mathematical results, their reasonableness or limitations.Limited use of appropriate mathematical notation, representations, or terminology, with limited accuracy.Attempted communication of mathematical ideas, with limited reasoning.Limited attempt to form or test a prediction. |