

Assessment Task Notification

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Faculty: Mathematics	Course: Standard 2	Time allowed: > 2 weeks (not inclusive of holidays)
Teacher: Mr Jonovski	Email: Daniel.jonovski-grant@det.nsw.edu.au	
Task number: 1	Title: Assignment	
Year: 12	Due date: 07.02.24	Weighting: 20%

Syllabus outcomes assessed:

MS2-12-5: makes informed decisions about financial situations, including annuities and loan repayments.

MS2-12-6: solves problems by representing the relationships between changing quantities in algebraic and graphical forms.

MS2-12-9: chooses and uses appropriate technology effectively in a range of contexts, and applies critical thinking to recognise appropriate times and methods for such use.

MS2-12-10: uses mathematical argument and reasoning to evaluate conclusions, communicating a position clearly to others and justifying a response.

21st Century and employment related skills:

<input checked="" type="checkbox"/>	Communication	<input type="checkbox"/>	Use of technology
<input type="checkbox"/>	Critical Thinking	<input type="checkbox"/>	Self-reflection and refinement
<input type="checkbox"/>	Creativity	<input checked="" type="checkbox"/>	Problem Solving
<input type="checkbox"/>	Collaboration	<input type="checkbox"/>	Initiative and Enterprise
<input type="checkbox"/>	Planning and Organising	<input type="checkbox"/>	Cross-Cultural Understanding

Task description:

Students are to complete a take home task on the topics of Investment and Loans and Annuities. Students will be required to research certain real-life applications, show reasoning and perform mathematical calculations in response to questions within the task.

Students should submit a portfolio of work. The work should be presented in a neat manner that is easy to follow. A marking rubric is attached to the assignment.

Assessment criteria:

You will be assessed on your ability to:

- successfully solve problems relating to financial mathematics.
- mathematical fluency.
- mathematical communication and reasoning.

Method of task submission:

Students are to submit their task before Wednesday 7th February 2024 (Term 1 Week 2) to the library by 8:20am. Any submission that is after this time period, an illness/misadventure form must be completed through the year deputy to receive marks for this task. Should a task not be submitted, the student will be awarded a zero mark.

Marking guidelines:

Grade	Descriptor	Mark (%)
A	The student demonstrates extensive knowledge of content and understanding of course concepts, and applies highly developed skills and processes in a wide variety of contexts. In addition the student demonstrates creative and critical thinking skills using perceptive analysis and evaluation. The student effectively communicates complex ideas and information.	85-100
B	The student demonstrates thorough knowledge of content and understanding of course concepts, and applies well-developed skills and processes in a variety of contexts. In addition the student demonstrates creative and critical thinking skills using analysis and evaluation. The student clearly communicates complex ideas and information.	65 - 84
C	The student demonstrates sound knowledge of content and understanding of course concepts, and applies skills and processes in a range of familiar contexts. In addition the student demonstrates skills in selecting and integrating information and communicates relevant ideas in an appropriate manner.	50 - 64
D	The student demonstrates a basic knowledge of content and understanding of course concepts, and applies skills and processes in some familiar contexts. In addition the student demonstrates skills in selecting and using information and communicates ideas in a descriptive manner.	30 - 49
E	The student demonstrates an elementary knowledge of content and understanding of course concepts, and applies some skills and processes with guidance. In addition the student demonstrates elementary skills in recounting information and communicating ideas.	10 - 29
N (Stages 5 and 6)	Task not submitted or did not make a reasonable attempt.	0-9

Year 12 Mathematics Standard 2

Assessment Task 1 – Marking Guidelines

PART A

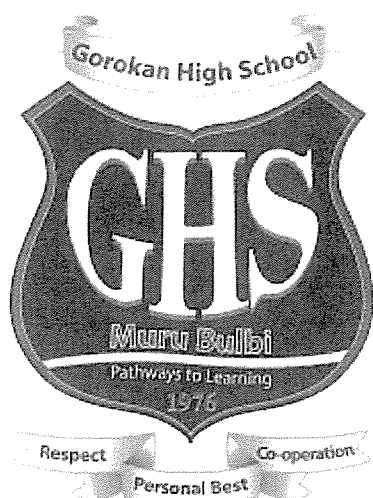
Question	Marking Guideline
1a	2 Marks: Both houses identified and features are shown. 1 Mark: 1 house is identified and features shown. 0 Marks: Did not address the question.
1b	3 Marks: Identifies the property and purchase price. Explains and justifies in detail their reasoning referencing the features of the house by comparison. 2 Marks: Identifies the property and purchase price. Explains and justifies their reasoning referencing the features of the house. 1 Mark: Identifies the property and purchase price. Minimal explanation and justification. 0 Marks: Did not address the question.
2a	1 Mark: A bank and rate was identified and screenshot provided. 0 Marks: Question was not fully addressed.
3a	3 Marks: 3 out of 3 are correct for the categories and all working out is shown. 2 Marks: 2 out of the 3 are correct for the categories (and all working out is shown). 1 Mark: 1 out of the 4 are correct for the categories and all working out is shown. 0 Marks: No calculations are correct and/or no working out is shown.
3b	1 Mark: Correct calculation and all working out is shown. 0 Marks: Incorrect calculation and/or no working out is shown.
3c	1 Mark: Correct calculation and all working out is shown. 0 Marks: Incorrect calculation and/or no working out is shown.
4a	1 Mark: Monthly repayment is stated and proof of online calculator is provided. 0 Marks: No monthly repayment and/or no proof of online calculator provided.
4b	1 Mark: Monthly repayment is stated and proof of online calculator is provided. 0 Marks: No monthly repayment and/or no proof of online calculator provided.
4c	2 Marks: Correct answer, with all mathematical working out shown. 1 Mark: Makes some attempt and evidence of knowledge working to the correct answer. 0 Marks: Incorrect calculation and/or no working out is shown.
4d	3 Marks: Identifies the loan period. Compares and contrasts in detail their reasoning using mathematical calculations. 2 Marks: Identifies the loan period. Compares and contrasts in some form their reasoning using mathematical calculations. 1 Mark: Identifies the loan period. Does not compares and contrast their reasoning using mathematical calculations. 0 Marks: Did not address the question.
5a	1 Mark: Correct calculation and all working out is shown. 0 Marks: Incorrect calculation and/or no working out is shown.

6a	<p>7 Marks: All Calculations are correct for all Seven of the expenses and all working out is shown.</p> <p>6 Marks: 6 out of 7 calculations are correct for all Seven of the expenses and all working out is shown.</p> <p>5 Marks: 5 out of 7 calculations are correct for all Seven of the expenses and all working out is shown.</p> <p>4 Marks: 4 out of 7 calculations are correct for all Seven of the expenses and all working out is shown.</p> <p>3 Marks: 3 out of 7 calculations are correct for all Seven of the expenses and all working out is shown.</p> <p>2 Marks: 2 out of 7 calculations are correct for all Seven of the expenses and all working out is shown.</p> <p>1 Mark: 1 out of 7 calculations are correct for all Seven of the expenses and all working out is shown.</p> <p>0 Marks: All Calculations are incorrect for all Seven of the expenses and/or no working out is shown.</p>
6b	<p>1 Mark: Correct calculation and all working out is shown.</p> <p>0 Marks: Incorrect calculation and/or no working out is shown.</p>
7	<p>2 Marks: All calculations are correct and working out is shown.</p> <p>1 Mark: Makes progress to finding the correct answer and working out is shown.</p> <p>0 Marks: Question is not addressed and/or no working out is shown.</p>

PART B

Question	Marking Guideline
1a	<p>2 Marks: Vehicle is shown and all features listed with screenshot or weblink to advert.</p> <p>1 Mark: Vehicle is shown, some features and/or weblink is listed.</p> <p>0 Marks: Question not addressed.</p>
2a	<p>1 Mark: Monthly repayment stated and proof of screenshot.</p> <p>0 Marks: Question is not addressed.</p>
2ai	<p>2 Marks: All aspects of the recurrence relation are correct.</p> <p>1 Mark: some errors in the recurrence relation are correct.</p> <p>0 Marks: Question is not addressed.</p>
2aii	<p>3 Marks: All component of the spreadsheet are correct showing the first 6 months of payments.</p> <p>2 Marks: All components of the spreadsheet are complete with minor errors.</p> <p>1 Mark: Some of the components are correct, showing some understanding.</p> <p>0 Marks: Question is not addressed.</p>
2aiii	<p>2 marks: All calculations are correct.</p> <p>1 Mark: One calculation is correct.</p> <p>0 Mark: Question is not addressed.</p>
3	<p>2 Marks: All components are correct.</p> <p>1 Mark: Shows some understanding with some calculations correct.</p> <p>0 Mark: Question is not addressed.</p>

GOROKAN HIGH SCHOOL



I confirm that this is all my own work. I have not plagiarised the work of others.

Student Name:

Student Signature:

Year 12 (2024)
Mathematics
Standard 2

Part A = /29

Part B = /12

Total Marks = /41

Assessment Task 1
Weighting: 20%

Due Date:
Wednesday
07/02/2024

Hand in to the
library by
8:20am.

PART A – BUYING AN INVESTMENT PROPERTY (30 Marks)

1 You want to purchase an investment property on the Central Coast. You have saved a deposit of \$200,000 for the purchase of the property and a further \$50,000 for expenses (stamp duty, legals etc.) and have been given approval for a loan for a maximum of \$800,000. This gives you a total purchase budget of \$1,000,000 (not including expenses such as stamp duty, bank charges, solicitor fees).

1a) Identify two (2) houses you are interested in purchasing: 2 Marks
Include a picture of the properties, the features, location and purchase price (If a price range, take the highest amount).

1b) Select one of the properties to purchase, assuming you pay the purchase price as advertised (If a price range, take the highest amount). 3 Marks
Explain and justify why you selected this particular property over the other property (e.g. price, location, size, bedrooms, renovated vs unrenovated etc.).

2) **You are going to purchase the property.**

2a) Research a home loan you intend to use. Identify the name of the loan and interest rate. (e.g. CBA – Standard Variable Rate). Provide a screenshot of this loan. 1 Mark

3) **Calculate the total cost of your property.**

3a) Calculate the costs associated with your purchase. You need to include in your calculations stamp duty, bank charges and solicitor's fees, as per the information below: 3 Marks

Stamp Duty	Use the below calculator (screenshot proof) https://www.realestate.com.au/home-loans/stamp-duty-calculator
Bank Charges	0.13% of the purchase price.
Solicitors Fees	\$2250 flat fee

3b) What is the total cost of purchasing your property? (Purchase Price + Expenses). 1 mark

3c) How much are you going to be borrowing? Remember, you had a \$250 000 deposit saved up in total to cover the purchase price and expenses. 1 Mark

4) **Calculate the monthly repayments of the loan.** Go to <https://www.yourmortgage.com.au/calculators/home-loan-repayment/>
Use the calculator to answer all aspects of question 4.

4a) What is the monthly repayment amount for a **30 year loan**. Use the interest rate identified in question 2a. Provide proof of the use of the online calculator by either printing the page, or taking a screenshot. 1 Mark

- 4b) What is the monthly repayment amount for a **25 year loan**. Use the interest rate identified in question 2a. Provide proof of the use of the online calculator by either printing the page, or taking a screenshot. 1 Mark
- 4c) How much would you save if you were to pay off the loan in 25 years, as opposed to 30 years. 2 Mark
- 4d) Compare and contrast the difference between the 30 year loan and the 25 year loan. Explain which loan period you are going to choose and justify your answer with mathematical reasoning. 3 Marks
- 5) **Calculate the income your property will attract.**
 You are able to rent the property out for the following values:
 a) \$500 per week if the property is valued under \$500,000
 b) \$650 per week if the property is valued between \$500,000 and under \$750,000
 c) \$800 per week if the property is valued \$750,000 or over.
- 5a) What is the annual income from rent for your property? (Assuming 1 year = 52 weeks) 1 mark
- 6a) Calculate the **monthly expenses** of your property for each of the below expenses. Show all relevant working out. 7 Marks
- Mortgage (Using monthly repayments from the loan identified previously in question 4d).
 - Real Estate agency fees at 7% per month of rental income
 - \$1500 p.a: Landlord's Insurance
 - \$1200 p.a: Water
 - \$2500 p.a: Property House Insurance
 - \$1800 p.a: Maintenance bills
 - 0.2% p.a of the purchase price: Council Rates
- 6b) What is the total monthly expenses of your property? 1 Mark
- 7) Unfortunately, 5 years into the investment you are forced to sell the property. Calculate the selling price of your property after 5 years, given the property has increased in value at 4.5% p.a. compounded annually. 2 Marks

PART B – BUYING A MOTOR VEHICLE (26 Marks)

- 1) You want to purchase a motor vehicle. You have a deposit of \$10 000 and have been given approval of a loan not exceeding \$10 000 and you want to pay the loan over 5 years. This gives you a total budget of \$20,000. You are going to use an online site to make your purchase on a car worth between \$15 000 and \$20 000.

Use: www.carsales.com.au

- 1a) Decide on which vehicle you are going to purchase. Explain the details of the car; showing details such as price, place of purchase, year, make, model of car. Please provide a screenshot of the car advertisement to receive full marks. 2 Marks

You need to provide the web address of your vehicle site.

- 2a) Declining Balance Annuity/Recurrence Relation Model: 1 Mark
The financial institution has given you a declining balance loan with an interest rate of 10.5% p.a. compounding monthly.
To find your monthly repayment use the below website, input in your borrowing amount and interest rate. Terms should be monthly, and fees \$0.

What is the monthly repayment? (Take a screenshot of the website indicating the monthly repayment).

- 2ai) Write a recurrence relation of this scenario in the form: 2 Marks
$$V_{n+1} = V_n(1 + r) - R$$
- 2aii) Using a spreadsheet and the above recurrence relation. Show the first 6 months of payments. 3 Marks

Payment Number	Payment Received	Interest Applied	Principal Reduction	Balance
0	0	0	0	Loan Amount
1				
2				

- 2aiii) How much have you paid to the financial institution over the first 6 months and how much has the balance reduced by? 2 Marks

- 3) You are going to sell your car at the end of the 3 years. Unfortunately, the car has depreciated in value. Copy and complete the following table to show the depreciated value of the vehicle at the end of each year. 2 Marks

Year	Depreciation %	Value at start of the year	Depreciation Amount	Value at end of the year
1	30			
2	20			
3	15			