



Condobolin High School

Notification of an Assessment Task



Name and Type of Task: Investigation – How can mathematics help me find the best deal?	
Subject: Year 10 5.1/5.2/5.3 Mathematics	Task Number: 2
Date Issued: Term 3 Week 4 Monday 12 th August 2024 Period 4	Date Due: Term 3 Week 6 Friday 30 th August 2024 Period 2
Total Marks: 60 (5.1/5.2) 45 5.3 Only 5.3 Total 105	Weighting: 35%
Class Teacher/s: Lanie Verinder, Rachel Waller, Judith Davis	Head Teacher: Judith Davis
Submission Instructions – Section 1: Students are to hand your task to their class teacher at the start of their Maths lesson on Friday 30 th August 2024 Period 2. Section 2: Students are to complete their consolidation task in their Maths lesson on Friday 30 th August 2024 Period 2 and hand in to their teacher.	
Task Context: In this unit you have been studying Financial Mathematics. In this unit, you have learnt how to use mathematics to solve financial problems. This assessment task gives you an opportunity to demonstrate your understanding of using mathematical strategies and formulas to investigate and compare the costs associated with buying an item. 5.3 only - You have been studying non-right-angled triangles and calculating unknown sides and angles using sine and cosine rules. You have also calculated the area of non-right-angled triangles using the area rule. This assessment task gives you the opportunity to demonstrate your understanding of the mathematical strategies and formulas to calculate lengths, angles and areas in non-right-angle triangles.	
Course Outcomes:	
5.1/5.2/5.3 MA5.1-4NA - solves financial problems involving earning, spending and investing money MA5.2-4NA - solves financial problems involving compound interest MA5.2-2WM - interprets mathematical or real-life situations, systematically applying appropriate strategies to solve problems	
5.3 Only MA5.3-15MG applies Pythagoras’ theorem, trigonometric relationships, the sine rule, the cosine rule and the area rule to solve problems, including problems involving three dimensions MA5.3-2WM - generalises mathematical ideas and techniques to analyse and solve problems efficiently	
Task Description:	
TASK 1: 5.1/5.2/5.3 You are required to investigate the costs associated with purchasing items of your choice through paying on terms, with or without a deposit and loans with simple and compound interest. To do this, you need to complete the questions on the following pages, ensuring you show all necessary working. Note: You will be given three lessons in class to work through the task. Extra time will be required to complete this task fully outside of class time.	
5.3 Only Use non-right-angled trigonometry to design a building roof that covers 500m ² to the nearest square metre.	

TASK 2: Consolidation Test

In this section, you will complete a short test in class. Questions will be like the investigation section of this task. (5.3 will have 2 sections)

5.1/5.2 – Task 1 – 45 marks

Task 2 – 15 marks (Total – 60 marks)

+ 5.3 Only – Task 1 – 30 marks

Task 2 - 15 marks (5.3 Total – 105 marks)

Criteria for Assessing Learning:

Students will be assessed on their ability to:

- Select items between given price values and record details of the items
- Calculate different options of purchasing items including, pay on terms with or without deposit, personal loans, including simple interest and compound interest calculated annually, monthly and daily
- Use mathematical calculations to reason and present arguments to finding the best deal

5.3 Only

- design a roof with at least 3 different non-right-angled triangles
- calculate sides & angles in non-right-angled triangles using sine rule & cosine rule for both sides and angles
- calculate areas of non-right-angled triangles
- includes all shape dimensions
- diagram in proportion
- calculate the total area of 500 m² to the nearest square metre

Key Verbs:

Calculate: Determine the value of

Critical Reflection: Support an argument or conclusion using mathematical calculation

Design: Plan something with a specific purpose or intention in mind

Find: Identify the solution/item

Investigate: Plan, inquire into and draw conclusions about

Justify: Support an argument or conclusion

Reason: Support an argument or conclusion by drawing logical conclusions based on evidence.

Marking Criteria:	
Description	Grade
<p><u>Grade A</u></p> <ul style="list-style-type: none"> - Selects all items and records details accurately - Accurately and efficiently uses appropriate strategies to solve all problems involving pay on terms, simple and all compound interest including monthly and daily - Uses all mathematical calculations and reasoning to find the best deal for all three tasks - Thoroughly reflects on mathematical calculations and reasoning to the question 'How mathematics can help me find the best deal' 	41-45
<p><u>Grade B</u></p> <ul style="list-style-type: none"> - Selects all items and records most details accurately - Accurately and efficiently uses appropriate strategies to solve all problems involving pay on terms, simple and annual compound interest - Uses all mathematical calculations and reasoning to find the best deal for at least two tasks - Reflects on mathematical calculations and reasoning to the question 'How mathematics can help me find the best deal' 	32-40
<p><u>Grade C</u></p> <ul style="list-style-type: none"> - Selects at least two items and records details accurately - Accurately and efficiently uses appropriate strategies to solve all problems involving pay on terms, simple and at least one compound interest - Uses most mathematical calculations and reasoning to find the best deal for at least two tasks - A basic reflection on the question 'How mathematics can help me find the best deal' 	18-31
<p><u>Grade D</u></p> <ul style="list-style-type: none"> - Selects at least one item and records details - Accurately and efficiently uses appropriate strategies to solve most problems involving pay on terms, simple interest or compound interest - Uses some mathematical calculations and reasoning to find the best deal for at least one task with errors 	9-17
<p><u>Grade E</u></p> <ul style="list-style-type: none"> - Minimal details recorded for items - Mathematical calculations not made or calculations are made with significant errors to find the best deal 	0 - 8

Marking Guidelines: Section 2

Marks for the consolidation test will be allocated on the test.	/15
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Marking Criteria:	
Description	Grade
<p><u>Grade A - 5.3 Only</u></p> <ul style="list-style-type: none"> - Designs a unique and individual roof with at least three different non-right angled triangles drawn in proportion - Calculates all required lengths and angles using sine and cosine rule correctly - All side lengths and at least one angle shown for each shape - Correctly calculates the area of each individual shape - Diagram drawn in proportion - Total area of 500m² to the nearest square metre 	27-30
<p><u>Grade B - 5.3 Only</u></p> <ul style="list-style-type: none"> - Designs a unique and individual roof with at least three different non right angled triangles drawn in proportion - Calculates almost all required lengths and angles using sine and cosine rule correctly - All side lengths and at least one angle shown for each shape - Correctly calculates the area of each individual shape - Diagram drawn mostly in proportion - Total area of 500m² to nearest ten square metres 	21-26
<p><u>Grade C - 5.3 Only</u></p> <ul style="list-style-type: none"> - Designs a unique and individual roof with at least three different non right angled triangles - Calculates most required lengths and angles using sine and cosine rule with minimal errors - Most side lengths and ane angle shown for each shape - Correctly calculates the area of most individual shapes - Diagram is in proportion - Total area calculated between 450m² and 550m² 	12-20
<p><u>Grade D - 5.3 Only</u></p> <ul style="list-style-type: none"> - Designs a unique and individual roof with at least three different non right angled triangles - Calculates some required lengths and angles using sine and cosine rule with errors - Some side lengths and/or angles shown for each shape - Calculates the area of most individual shapes with errors - Diagram drawn but not in proportion - Total area calculated with errors or outside 450m² to 550m² 	6-11
<p><u>Grade E - 5.3 Only</u></p> <ul style="list-style-type: none"> - Designs a roof - Calculates some required lengths and angles - Minimal side lengths and/or angles shown - Diagram not drawn or not in proportion - Calculations made for the area with errors 	0 - 5

Marking Guidelines: Section 2

Marks for the consolidation test will be allocated on the test.	/15
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5.1/5.2/5.3 Mathematics

How can mathematics help me find the best deal?

(45 Marks)

You are to investigate and compare the costs of buying an item on terms and by taking out a small loan. This will be completed by using various forms of simple and compound interest.

Task 1 – Buying an expensive item on terms

1. Find an item

(4 marks)

Choose a new item between \$500 and \$750 that you would like to purchase. You could buy a camera, gaming console, television, tablet, iPad, fridge, drone etc.

You will need an advertisement for your item and be able to record the details of your item. You could go to a website such as <http://www.harveynorman.com.au/> www.harveynorman.com.au, www.betta.com.au, www.thegoodguys.com.au, or choose an item you want from a shopping catalogue.

a) Record the details of the item, including the brand, item, model and price.

(2 marks)

Item	
Brand	
Model	
Price	

b) Include a picture of the full advertisement of the item from the catalogue, brochure or website in the space below. The advertisement must include a picture of the item and its price. **(2 marks)**

2. The cost of purchasing your item.

(12 marks)

a) Investigate the cost of purchasing your item on the following terms:

Option 1: No deposit. \$10 per week for 2 years.

(2 marks)

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Option 2: 10% deposit. \$40 per month for 2 years.

(3 marks)

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Option 3: 15% deposit. \$18 per fortnight for 2 years.

(3 marks)

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b) Which option would you choose? Justify your answer with mathematical calculations and reasoning.

(4 marks)

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Task 2 – Buying an item on a personal loan

1. Finding an item

(4 marks)

Investigate the cost of taking out a personal loan for something worth between \$5 000 and \$10 000. *e.g.* A small car, a holiday, musical or sporting equipment.

- a) Record the details of the item including the brand, item, model and its price. (2 marks)

Item	
Brand or ...	
Model or	
Price	

- b) Include a picture of the full advertisement of the item from the catalogue, brochure or website in the space below. The advertisement must include a picture of the item and its price. (2 marks)

2. The cost of purchasing your item. (11 marks)

a) Investigate the cost of purchasing your item on the following terms:

Option 1: Borrowed over 5 years at 6% p.a. simple interest. (2 marks)

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Option 2: Borrowed over 5 years at 4% p.a. interest compounded annually. (3 marks)

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Option 3: Borrowed over 4 years at 4.5% p.a. interest compounded monthly. (3 marks)

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b) Which option would you choose? Justify your answer with mathematical calculations and reasoning. (3 marks)

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Task 3 – Investigating personal loans

(14 marks)

- a) Three different bank accounts offer very similar deals on their personal loans. Consider the following options and determine which one provides the best value for money.
Research or select 3 different interest rates between 5% and 10%. Allocate the lowest rate as interest rate 1 and the highest rate as interest rate 3.

Interest rate 1 (lowest rate): _____ % p.a.

Interest rate 2 (middle rate): _____ % p.a.

Interest rate 3 (highest rate): _____ % p.a.

Option 1: Borrowed over 5 years at interest rate 1 compounded annually (3 marks)

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Option 2: Borrowed over 5 years at interest rate 1 compounded monthly (4 marks)

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Option 3: Borrowed over 5 years at interest rate 1 compounded daily (4 marks)
(Assume 365 days per year)

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b) Which option would you choose? Justify your answer with mathematical calculations and reasoning. (3 marks)

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5.3 Mathematics Only

Applications of Non Right Angled Triangles

(30 Marks)

1. Design a plan for a building roof that covers 500m^2 to the nearest square metre. (25 marks)

Your plan will be the aerial view of the roof

Your plan must be individual and unique. It must include:

- At least 3 non-right angled triangles
 - Calculations for 1 side using the sine rule
 - Calculations for 1 side using the cosine rule
 - Calculations for 1 angle using the sine rule
 - Calculations for 1 angle using the cosine rule
 - Each final shape is to include all side lengths and at least 1 included angle size written on diagram
 - A diagram which is in proportion (does not need to be to scale)
 - The area of each shape calculated individually and the total area of your roof
 - The total area of your roof is to be 500m^2 to the nearest square metre
2. Recount the steps you needed to take to complete your roof area that covers 500m^2 to the nearest square metre. Include any changes you made and how you did this. (5 marks)