Year 11 Mathematics Standard

Task 3 – Breaking Down Questions: Investigation and Quiz

Due Date: 24th June 2024

Task Distributed: 4th June 2024

Unit: Algebra: Formulae & Equations, Measurement: Practicalities of Measurement, Classifying & Representing Data

Task Type: Investigation and Quiz

Task Weighting: 25%

Outcomes: MS11-1, MS11-2, MS11-3, MS11-7, & MS11-10

Task Description

Part A: Create a Topic Study Guide

Students will create a Topic Study Guide for the topics outlined above. The Topic Study Guide will consist of:

- A glossary of the key verbs and topic-specific terminologies presented in these topics from a list of HSC questions provided to you in **your exam pack**.
- Identification of questions from the topics listed above from **your exam pack**.
- Annotations of the worked solutions to each HSC question that you have selected from **your exam pack.**

Your teacher will provide you with a digital copy of **your exam pack** that consists of HSC questions from prior years and a **blank scaffold** for you to use to form your topic study guide.

QUESTIONS THAT YOU HAVE IDENTIFIED BUT ARE NOT LISTED IN THE EXAM PACK WILL NOT BE COUNTED TOWARDS YOUR SUBMISSION.

Part B: Moodle Quiz

Students will sit a short in-class Moodle quiz assessing the knowledge and skills developed through your investigation. The questions will require you to:

- Identify key verbs and terminology in past HSC questions.
- Match definitions to key verbs and key math terms.
- Identify steps to solve a question when presented with a key term
- Solve a range of past HSC multiple-choice questions from the topic areas listed above.

Details of Submission

Part A: Topic Study Guide
This needs to be submitted before you sit the **Moodle Quiz: 24th June 2024**.

Part B: Moodle Quiz
For the Moodle Quiz, you must bring the following equipment.

- Board approved calculator
- Blue or black pen

You can successfully prepare for the Moodle Quiz by:

- Being familiar with your topic study guide
- Reviewing class work and past HSC examples from each topic in the study guide.
- Ensuring all set work is up to date.
- Practice completing examination questions with detailed answers under time pressure. (1 mark = 1.5 minutes).
- Seek teacher assistance for unclear work.
- Review the HSC Reference Sheet. You will be provided with one for the quiz.

Teacher Feedback and Student Self-Reflection

- The task will typically be returned to students within 14 days of the due date.
- At this time feedback including information on how to improve will be provided through analysis of the examination questions as a class discussion. Explanation will be provided as requested.
- Students can clarify or seek further feedback by speaking with their teacher or the assessment marker.

Upon return of the task, students will also be expected to complete a self-reflection. This will require students to review incorrect responses by seeking clarification from the teacher. Additionally, students will be required to complete a survey in reflection of the examination.

How does this link to my learning?

- It will assist you in developing your skills and understanding in how to recognise these key terms in examination style questions and determine how they lead you to the solution you are required to develop
- This task will be used by you and your teachers to assess your knowledge and understanding of course outcomes and allow you to refine your skills as you prepare for the HSC examination.
- This task will draw together the above outcomes and assess your ability to apply a range of mathematical skills and techniques that you have covered in class.

Assessment Procedures

Students who are absent from the examination, or have a legitimate reason for missing the task, must notify the school before the exam commences. To avoid a zero mark being awarded, any absence must be supported by valid misadventure/illness documentation as outlined in the Year 12 Assessment Booklet.

Instructional Marking Rubric for Part A

Category	0 Marks	1 Mark	2 Marks	3 Marks
Identification of key HSC verbs	Does not identify a question verb or does not show a clear understanding of the verb's meaning.	Correctly identifies at least TWO verbs from suitable HSC questions and attempts to explain its meaning.	Correctly identifies at least FOUR verbs identified in suitable HSC questions and correctly explains their meaning.	Correctly identifies at least SIX different verbs identified in suitable HSC questions and correctly explains their meaning.
Definitions of topic specific terminology	Does not correctly define any key mathematical terms for either topic or does not show a clear understanding of the terminology.	Correctly identifies at least THREE key terms identified in suitable HSC questions, but the links to the syllabus ideas are not well explained.	Correctly defines at least TWO key terms identified in suitable HSC questions **from each topic** and provides sufficient understanding of how they link to syllabus ideas / techniques.	Correctly defines at least FOUR key terms identified in suitable HSC questions from **each topic area** identified in suitable HSC questions and provides sufficient understanding of how they link to syllabus ideas / techniques.
Identification of questions linked to the topic areas	Does not identify any questions that link to either topic.	Attempts to identify and highlight the key verbs and underline the topic terminology from at least TWO suitable HSC question.	Identifies and correctly highlights the key verbs and underlines the topic terminology for at least ONE question **from each topic**. They must be suitable HSC questions.	Identifies and correctly highlights the key verbs and underlines the topic terminology for at least TWO questions **from each topic**. They must be suitable HSC questions.
Annotation of worked solutions, explaining why each step was used.	Does not identify a question or does attempt to annotate a solution to a question.	Attempts to annotate ONE identified question that provides a clear understanding of how the key verbs and topic specific terminology link to the solution.	Correctly annotates at least ONE question **from each topic** that provides a clear understanding of how the key verbs and topic specific terminology link to the solution.	Correctly annotates at least TWO questions **from each topic** that provides a clear understanding of how the key verbs and topic specific terminology link to the solution.

Worked Example

Trigonometry – Topic Study Guide	
Question Verb(s)	**Definition**
What is / Find	*Find the value or the numerical answer*
Key Terms	**Definition**
Reaction Time	*The length of time taken for a person to respond to a given stimulus or event*
Reaction Time Distance	*The distance the car travels from the time a danger is detected until the brake is pressed*
Braking Distance	*The distance a vehicle will travel from the point when its brakes are fully applied to when it comes to a complete stop*
Stopping Distance	*The distance a vehicle will travel before it comes to a complete stop. In this case, from the moment a danger is detected*
Questions Appearing in Past HSC Papers	
Question Name	2018 Standard Mathematics HSC Q28 e) Long Response

Sophie is driving at 70 km/h. She notices a branch on the road ahead and decides to apply the brakes. Her reaction time is 1.5 seconds. Her braking distance (D metres) is given by $D = 0.01v^2$, where v is speed in km/h. **3**

stopping distance = {reaction time distance} + {braking distance}

What is Sophie's stopping distance, to the nearest metre?

Worked Solution	Annotation
$\frac{70}{60 \times 60}$ km/sec $= 0.01944\ldots\ldots$ km/ sec 0.01944 x 1000 = 19.44 m/sec reaction time distance $= 19.44 \times 1.5$ $= 29.16$ m Braking distance $D = 0.01v^2$ $= 0.01 \times 70^2$ $= 49$ m $\therefore$ Total stopping distance = reaction time distance + braking distance $= 29.16 + 49$ $= 78.16\ldots$ = 78 m (nearest m)	*To calculate the reaction time distance (RTD), we use Distance = $\frac{Speed}{Time}$.* *The speed is 70km/h, but we need to figure out how far Sophie travelled in 1.5 seconds, so we convert 70km/h into km/sec.* *The braking distance will result in meters, so we will convert the RTD into meters also to ensure we are working with the same units.* *The RTD occurs over 1.5 seconds, so we multiply the metres traveled per second by 1.5.* *We calculate the braking distance by substituting 70km/h in place of 'v' from the formula listed in the question.* *To calculate the total stopping distance we need to add the reaction time distance and the braking distance.* *We round the answer to the nearest meter as stated in the question.*

EVIDENCE 1:

Topic Study Guide:	
Question Verb(s)	**Definition**
Key Terms	**Definition**
Question Appearing in Past HSC Papers	

Worked Solution	**Annotation**

Evidence 2

Topic Study Guide:	
Question Verb(s)	**Definition**
Key Terms	**Definition**
Question Appearing in Past HSC Papers	

Worked Solution	**Annotation**

Evidence 3

Topic Study Guide:	
Question Verb(s)	**Definition**
Key Terms	**Definition**
Question Appearing in Past HSC Papers	

Worked Solution	**Annotation**

Evidence 4

Topic Study Guide:	
Question Verb(s)	**Definition**
Key Terms	**Definition**
Question Appearing in Past HSC Papers	

Worked Solution	**Annotation**

Evidence 5

Topic Study Guide:	
Question Verb(s)	**Definition**
Key Terms	**Definition**
Question Appearing in Past HSC Papers	

Worked Solution	**Annotation**

Topic Study Guide:	
Question Verb(s)	**Definition**
Key Terms	**Definition**
Question Appearing in Past HSC Papers	

Worked Solution	**Annotation**

Evidence 7

Topic Study Guide:	
Question Verb(s)	**Definition**
Key Terms	**Definition**
Question Appearing in Past HSC Papers	

Worked Solution	**Annotation**

Evidence 8

Topic Study Guide:	
Question Verb(s)	**Definition**
Key Terms	**Definition**
Question Appearing in Past HSC Papers	

Worked Solution	**Annotation**
