Mathematics Standard Year 11

2021

Assessment Notification: TASK 1

Task Date: Thursday, 6th May 2021

Notification date: Thursday 22nd April 2021

Duration: 50 minutes.

Assessment Weighting: 30%

Content: MS-A1 Formulae and Equations

MS-F1.2 Earning and Managing Money

MS-S1.1 Classifying and Representing Data

Assessment will be an in-class test. Test questions will a combination of seen questions (taken from the Mathematics Standard Worksheets attached) and unseen questions.

You will be supplied with a NESA approved Standard Mathematics Reference sheet.

You may use a scientific calculator.

Outcomes:

MS11-1	uses algebraic and graphical techniques to compare alternative solutions to contextual problems
MS11-2	represents information in symbolic, graphical and tabular form
MS11-6	Makes predictions about everyday situations based on simple mathematical models.
MS11-10	justifies a response to a given problem using appropriate mathematical terminology and/or calculations

Recommended preparation:

Completion of Worksheets

Preparation of study/summary sheet (You will **NOT** be allowed to take this into the test)

Chapter Revision.

Extra homework questions as given by your teacher.

Attached to this notification is a copy of the Syllabus Dot points that will be covered in the Assessment.

SYLLABUS DOT POINTS

Algebra

MS-A1 Formulae and Equations

Outcomes

A student:

› uses algebraic and graphical techniques to compare alternative solutions to contextual problems MS11-1
› makes predictions about everyday situations based on simple mathematical models MS11-6
› uses appropriate technology to investigate, organise and interpret information in a range of contexts MS11-9
› justifies a response to a given problem using appropriate mathematical terminology and/or calculations MS11-10

Related Life Skills outcomes: MALS6-1, MALS6-7, MALS6-8, MALS6-13, MALS6-14

Subtopic Focus

The principal focus of this subtopic is to provide a solid foundation in algebraic skills, including finding solutions to a variety of equations in work-related and everyday contexts.

Students develop awareness of the applicability of algebra in their approach to everyday life.

Within this subtopic, schools have the opportunity to identify areas of Stage 5 content which may need to be reviewed to meet the needs of students.

Content

Students:

- review substitution of numerical values into linear and non-linear algebraic expressions and equations ◊
  - review evaluating the subject of a formula, given the value of other pronumerals in the formula
  - change the subject of a formula
  - solve problems involving formulae, including calculating distance, speed and time (with change of units of measurement as required) or calculating stopping distances of vehicles using a suitable formula **AAM**
- develop and solve linear equations, including those derived from substituting values into a formula, or those developed from a word description **AAM** ◊
- calculate and interpret blood alcohol content (BAC) based on drink consumption and body weight **AAM**
  - use formulae, both in word form and algebraic form, to calculate an estimate for blood alcohol content (BAC), including $BAC_{\text{Male}} = \frac{10N-7.5H}{6.8M}$ and $BAC_{\text{Female}} = \frac{10N-7.5H}{5.5M}$ where N is the number of standard drinks consumed, H is the number of hours of drinking, and M is the person's weight in kilograms
  - determine the number of hours required for a person to stop consuming alcohol in order to reach zero BAC, eg using the formula $\text{time} = \frac{BAC}{0.015}$
  - describe limitations of methods estimating BAC

- calculate required medication dosages for children and adults from packets, given age or weight, using Fried's, Young's or Clark's formula as appropriate **AAM**
  - Fried's formula: Dosage for children $1-2$ years $= \frac{\text{age (in months)} \times \text{adult dosage}}{150}$
  - Young's formula: Dosage for children $1-12$ years $= \frac{\text{age of child (in years)} \times \text{adult dosage}}{\text{age of child (in years)} + 12}$
  - Clark's formula: Dosage $= \frac{\text{weight in kg} \times \text{adult dosage}}{70}$

Financial Mathematics

MS-F1 Money Matters

Outcomes

A student:

› represents information in symbolic, graphical and tabular form MS11-2
› models relevant financial situations using appropriate tools MS11-5
› makes predictions about everyday situations based on simple mathematical models MS11-6
› uses appropriate technology to investigate, organise and interpret information in a range of contexts MS11-9
› justifies a response to a given problem using appropriate mathematical terminology and/or calculations MS11-10

Related Life Skills outcomes: MALS6-2, MALS6-5, MALS6-6, MALS6-7, MALS6-8, MALS6-13, MALS6-14

Subtopic Focus

The principal focus of this subtopic is to calculate and graph simple interest, manage earnings, wages and taxation, and develop an appropriate budget for a given situation.

Students develop an ability to justify various types of financial decisions which will affect their life now and into the future.

Within this subtopic, schools have the opportunity to identify areas of Stage 5 content which may need to be reviewed to meet the needs of students.

F1.2: Earning and managing money

Students:

- calculate monthly, fortnightly, weekly, daily or hourly pay rates from a given salary, wages involving hourly rates and penalty rates, including situations involving overtime and other special allowances, and earnings based on commission (including commission based on a sliding scale), piecework or royalties ◊
  - calculate annual leave loading
  - calculate payments based on government allowances and pensions (ACMGM003)
- calculate income tax ◊
  - identify allowable tax deductions
  - calculate taxable income after allowable tax deductions are taken from gross pay
  - calculate the Medicare levy (basic levy only)
  - calculate the amount of Pay As You Go (PAYG) tax payable per fortnight or week using current tax scales, and use this to determine if more tax is payable or if a refund is owing after completing a tax return
- calculate net pay following deductions from income ◊
- use technology to perform financial computations, for example calculating percentage change, calculating tax payable and preparing a wage-sheet ◊

Statistical Analysis

MS-S1 Data Analysis

Outcomes

A student:

› represents information in symbolic, graphical and tabular form MS11-2
› develops and carries out simple statistical processes to answer questions posed MS11-7
› uses appropriate technology to investigate, organise and interpret information in a range of contexts MS11-9
› justifies a response to a given problem using appropriate mathematical terminology and/or calculations MS11-10

Related Life Skills outcomes: MALS6-2, MALS6-9, MALS6-13, MALS6-14

Subtopic Focus

The principal focus of this subtopic is planning and management of data collection, classification and representation of data, calculation of summary statistics for single datasets and their use in the interpretation of data.

Students develop awareness of the importance of statistical processes and inquiry in society.

Within this subtopic, schools have the opportunity to identify areas of Stage 5 content which may need to be reviewed to meet the needs of students.

Content

S1.1: Classifying and representing data (grouped and ungrouped)

Students:

- describe and use appropriate data collection methods for a population or samples ◊
  - investigate whether a sample obtained from a population may or may not be representative of the population by considering different kinds of sampling methods: systematic sampling, self-selected sampling, capture-recapture, simple random sampling and stratified sampling
  - investigate the advantages and disadvantages of each type of sampling
  - describe the potential faults in the design and practicalities of data collection processes, eg surveys, experiments and observational studies, misunderstandings and misrepresentations, including examples from the media
- classify data relating to a single random variable ◊
  - classify a categorical variable as either ordinal, eg income level (low, medium, high) or nominal, eg place of birth (Australia, overseas)
  - classify a numerical variable as either discrete, eg the number of rooms in a house, or continuous, eg the temperature in degrees Celsius
- review how to organise and display data into appropriate tabular and/or graphical representations **AAM** ◊
  - display categorical data in tables and, as appropriate, in both bar charts or Pareto charts
  - display numerical data as frequency distribution tables and histograms, cumulative frequency distribution tables and graphs, dot plots and stem and leaf plots (including back-to-back where comparing two datasets)
  - construct and interpret tables and graphs related to real-world contexts, including: motor vehicle safety including driver behaviour, accident statistics, blood alcohol content over time, running costs of a motor vehicle, costs of purchase and insurance, vehicle depreciation, rainfall, hourly temperature, household and personal water usage
- interpret and compare data by considering it in tabular and/or graphical representations **AAM** ◊
  - choose appropriate tabular and/or graphical representations to enable comparisons
  - compare the suitability of different methods of data presentation in real-world contexts, including their visual appeal, eg a heat map to illustrate climate change data or the median house prices across suburbs