Leeton High School  
Assessment Task Notification  
General Mathematics (Preliminary)  
Assessment Task 3

Date: Friday 27th July 2012

Time Allowed: 2 periods

Topics:  
Right Angle Triangles (M4)  
Modelling Linear Relationships (AM2)  
Statistics (DA1 & DA2)  
Investing Money (FM2)

Weighting:  
15%

Outcomes to be assessed:

P1 develops a positive attitude to mathematics and appreciates its capacity to provide enjoyment and recreation

P2 applies mathematical knowledge and skills to solving problems within familiar contexts

P3 develops rules to represent patterns arising from numerical and other sources

P4 represents information in symbolic, graphical and tabular form

P5 represents the relationship between changing quantities in algebraic and graphical form

P6 performs calculations in relation to two-dimensional and three-dimensional figures

P7 determines the degree of accuracy of measurements and calculations

P8 models financial situations using appropriate tools

P9 determines an appropriate form of organisation and representation of collected data

P11 justifies his/her response to a given problem using appropriate mathematical terminology

Assessment Criteria

Right Angle Triangles (M4)

- use of Pythagoras’ theorem to find an unknown side in a right-angled triangle
- application of Pythagoras’ theorem to:
  - determine whether or not a triangle is right-angled
  - solve problems based on single right-angled triangles
  - calculate perimeters of irregularly shaped blocks of land
- defining sine, cosine and tangent ratios
- use of trigonometric ratios to find the length of an unknown side in a right-angled triangle
- use of trigonometric ratios to find the size of an unknown angle in a right-angled triangle using a calculator to approximate the angle to the nearest minute
- solution of problems involving angles of elevation and depression, given the appropriate diagram
- determining whether an answer seems reasonable by using a diagram drawn roughly in proportion

Modelling Linear Relationships (AM2)

- sketching graphical representations of quantities that vary over a period of time or in relation to each other
- Students should develop an understanding of a function as input — processing — output. It is not intended that students learn a formal definition of a function.
- identifying independent and dependent variables in practical contexts
- graphing of linear functions derived from everyday situations (e.g., cost of an excursion = fixed cost + cost per student x number of students) by plotting ordered pairs from tables of values
- calculating the gradients of such graphs with ruler and pencil
- establishing a meaning for the gradient in the given context
- establishing a meaning for the intercept on the vertical axis in the given context
- sketching graphs of linear functions expressed in the form \( y = mx + b \)
- development of a linear graph of the form \( y = ax \) from a description of a situation in which one quantity varies in a direct linear fashion with another, given one ordered pair
- using the above graph to establish the value of \( a \) (the gradient) and to solve problems related to the given variation context
- interpreting linear functions as models of physical phenomena
- using stepwise and piecewise linear functions to model situations encountered in daily life, e.g., parking charges, taxi fares, tax payments, mobile phone bills
recognising the limitations of such models, eg a person’s height as a function of age may be approximated by a straight line for a limited number of years, but not over a complete lifetime

using graphs to make conversions from one measurement to another eg $AUD to Euros

interpreting the graphical solution of simultaneous linear equations drawn from practical situations

drawing a line of best fit on a graphed set of ordered pairs with a ruler and pencil.

Statistics (DA1 & DA2)

the importance of analysing data in planning and decision-making by governments and businesses

the process of statistical inquiry, including the following steps:

- posing questions
- collecting data
- organising data
- summarising and displaying data
- analysing data and drawing conclusions
- writing a report

the role of statistical methods in quality control in manufacturing industries

issues of privacy and ethics in data collection and analysis

organisations that collect and/or use statistics, including the Australian Bureau of Statistics (ABS), the United Nations (UN), the World Health Organisation (WHO).

identification of the target population to be investigated

determining whether data for the whole population is available (eg the results of a round of a sporting competition), or whether sampling is necessary

recognising that the purpose of a sample is to provide an estimate for a particular population characteristic when the entire population cannot be accessed

classification of data as:

- Quantitative, either discrete or continuous
- Categorical
  eg gender (male, female) is categorical; height (measured in cm) is quantitative, continuous; quality (poor, average, good, excellent) is categorical; school population (measured in individuals) is quantitative, discrete

distinguishing between the following sample types:

- random
- stratified
- systematic

determination of which of the above sample types is appropriate for a given situation

relating sample selection to population characteristics, eg if 20% of the Australian population is aged under 20, your sample should include 20% of under 20s

generating random numbers with a table or a calculator to assist in establishing random samples

describing and using the ‘capture-recapture’ technique for estimating the size of populations, eg the number of fish in a lake

recognising the effect of sample size in estimating the nature of the population, eg using the number of boys and girls in a particular Year 11 class to estimate the gender ratio in Year 11 across NSW

Investing Money (FM2)

Calculate simple interest using I = Prn

Calculate monthly, quarterly, six-monthly interest rates based on quoted rates per annum

Use the formulae A = P(1 + r)^n to calculate future value, compound interest and present value

Calculate dividend paid on a shareholding and the dividend yield, excluding franked dividends

Extrapolate from the information shown, a prepared graph of share performance to suggest possible future movement

Calculate future and present value of an investment from prepared tables

Calculate the price of goods following inflation

Calculate the appreciated value of items such as stamp collection