Name: _____

Class: _____

HURLSTONE AGRICULTURAL HIGH SCHOOL

ASSESSMENT TASK ONE

2007

MATHEMATICS

GENERAL

Examiner: S. C. Faulds, G. K. Holmes

Time Allowed – Forty minutes
(plus 3 minutes reading time)

DIRECTIONS TO CANDIDATES

* Approved calculators may be used.
* Write your name and class in the space provided above and on the multiple choice answer sheet.
* Show all necessary working for Part B.
* Hand in your multiple choice answer sheet and question/answer booklet in the same bundle.

* **Part A** (10 marks)	10 multiple choice questions. Mark your answers in pencil on the answer sheet provided.
* **Part B** (20 marks)	2 questions, each worth 10 marks. Answer each question in the spaces provided in the question booklet.

PART A – MULTIPLE CHOICE **(10 marks – 1 mark each)**
Mark your answers on the answer sheet provided.

1. 0.015 92 written correct to 2 significant figures is:

   A: 0.01 B: 0.015 C: 0.016 D: 0.02

2. Find, using a calculator, the value of $\frac{3.75 \times 1.6}{1.2 - 0.11}$, correct to 2 decimal places.

   A: 4.6 B: 4.58 C: 4.89 D: 5.50

3. A measuring flask is marked with a 10mL scale for measuring volumes of liquids. If the flask shows it is holding 70mL, which of the following is correct?

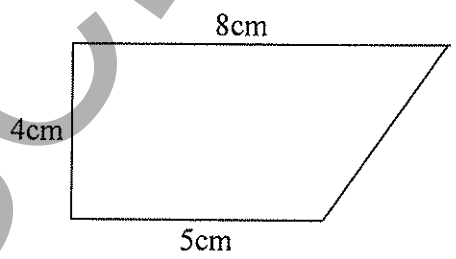
   A: Upper limit of accuracy 75mL
   Lower limit of accuracy 65mL
   Percentage error 7.1% (1 dec. pl.)

   B: Upper limit of accuracy 80mL
   Lower limit of accuracy 60mL
   Percentage error 14.3% (1 dec. pl.)

   C: Upper limit of accuracy 75mL
   Lower limit of accuracy 65mL
   Percentage error 14.3% (1 dec. pl.)

   D: Upper limit of accuracy 80mL
   Lower limit of accuracy 60mL
   Percentage error 28.6% (1 dec. pl.)

4.



NOT TO SCALE

The perimeter of the above trapezium is:

A: 17cm B: 22cm C: 26cm D: can't be determined

5. The solution of the equation $3(y + 4) = y - 8$ is:

A: $y = 10$ B: $y = 5$ C: $y = -5$ D: $y = -10$

6. The formula $V = \frac{1}{3}\pi r^2 h$ has its subject changed to h. The formula is now:

A: $h = \frac{3V}{\pi r^2}$ B: $h = \frac{1}{3}V\pi r^2$ C: $h = 3V\pi r^2$ D: $h = \frac{V}{3\pi r^2}$

7. The solution of the equation below contains one or more errors.

$$\frac{x}{2} - 5 = \frac{2}{3}$$
$$\frac{6x}{2} - 5 = \frac{12}{3} \quad \text{Line 1}$$
$$3x - 5 = 4 \quad \text{Line 2}$$
$$3x = -1 \quad \text{Line 3}$$
$$x = -\frac{1}{3} \quad \text{Line 4}$$

The is a mistake in:

A: Lines 1 and 3 B: Lines 1 and 2 C: Line 3 only D: Lines 2 and 3

8. The volume of a cardboard box is found to be 1 750 000cm^3. In cubic metres, the volume of the box is:

A: 0.001 75m^3 B: 0.0175m^3 C: 0.175m^3 D: 1.75m^3

9. When the number 3 200 is expressed in scientific, or standard notation, it is written as:

A: 32×10^2 B: 0.32×10^4 C: 3.2×10^3 D: 32×10^{-2}

10. It is estimated that Sydney house prices have fallen by 15% since 2004. By approximately what percentage will current prices have to increase so that 2004 values are restored?

A: 18% B: 15% C: 11% D: 117.6%

PART B – Show all working **(20 marks)**

Start each question on a new page, clearly showing your name and question number.
Use the paper provided to write your solutions for each question.

QUESTION 1 **Marks**

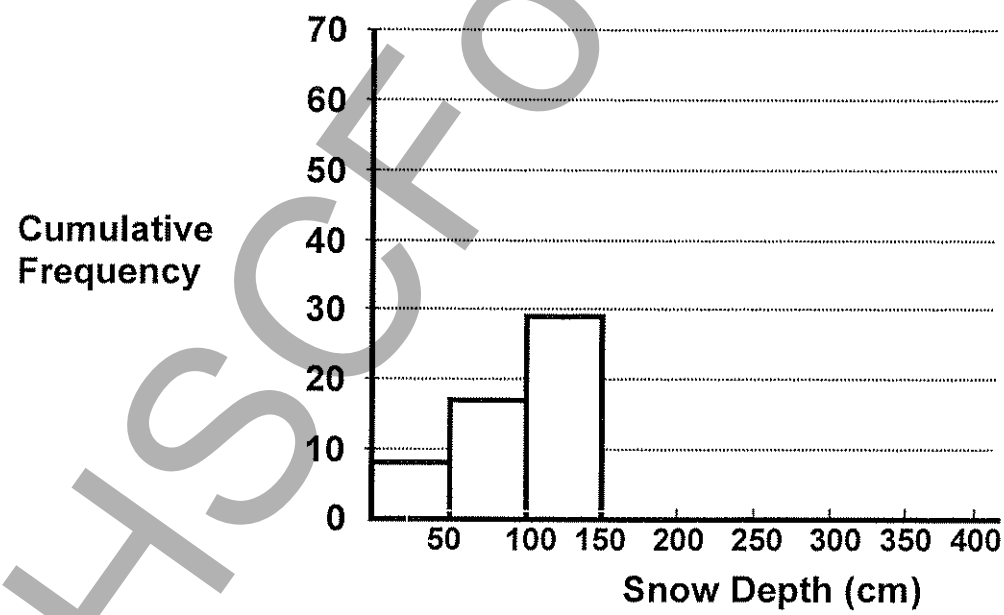
The table below shows the daily depth of snow over a 60 day period during the ski season.

Depth of Snow (cm)

Depth (cm)	Frequency	Cumulative Frequency
0-49	8	8
50-99	9	
100-149	12	
150-199	16	
200-249	7	
250-299	4	
300-349	2	
350-399	2	60

(a) Complete the cumulative frequency column in the table above. **2**

(b) The graph below gives an incomplete cumulative frequency histogram. On the graph, neatly complete the cumulative frequency histogram using data from the table above. **1**



(c) On the same graph as the cumulative frequency histogram, draw the ogive (ie. the cumulative frequency polygon. **2**

Marks

(d) Use your graph to find estimates for:

(i) the median depth of snow _____ 1

(ii) the lower quartile, Q_1. _____ 1

(iii) the upper quartile, Q_3. _____ 1

(e) Using your answers to (d) above, calculate the inter-quartile range. 2

_____

_____

QUESTION 2 (10 marks) (Answer in the space provided) Marks

There are 15 milk chocolates, 10 dark chocolates and 5 caramels in a lolly barrel. Two lollies are selected at random from the barrel (without replacement).

(a) Draw a probability tree to represent all possible selections. 2

(b) Use the diagram to find the probability of selecting:

(i) two milk chocolates. 1

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Marks

(ii) at least one dark chocolate. **2**

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(c) A sports promoter reads that Sydney has about 120 wet days each year and reasons that the chance of rain for a cricket match on 30th April is $\frac{1}{3}$. Is this reasoning correct? Explain. **2**

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(d) Which would give you the better chance; rolling one die or rolling two dice, if you wanted to throw a score of 6? Justify your answer. **2**

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(e) Three coins are tossed. What is the probability of getting at least one head? **1**

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HURLSTONE AGRICULTURAL HIGH SCHOOL

Year 12 General Mathematics 2007
Assessment Task 1

NAME.....

CLASS.....

EXAMPLE $2 + 4 =$

A 2 **B** 4 **C** 6 **D** 8 Ⓐ Ⓑ ● Ⓓ

ATTEMPT ALL QUESTIONS

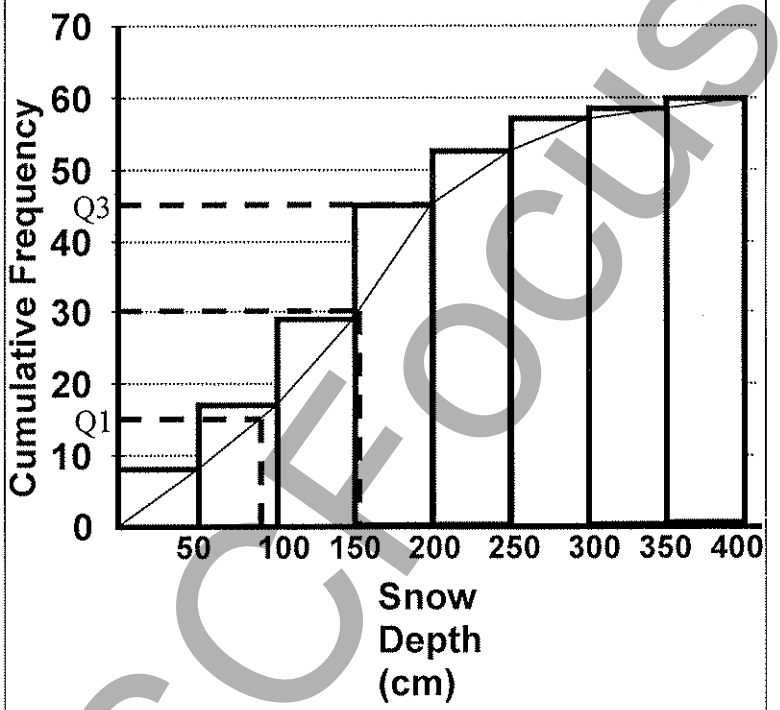
1	Ⓐ	Ⓑ	Ⓒ	Ⓓ
2	Ⓐ	Ⓑ	Ⓒ	Ⓓ
3	Ⓐ	Ⓑ	Ⓒ	Ⓓ
4	Ⓐ	Ⓑ	Ⓒ	Ⓓ
5	Ⓐ	Ⓑ	Ⓒ	Ⓓ
6	Ⓐ	Ⓑ	Ⓒ	Ⓓ
7	Ⓐ	Ⓑ	Ⓒ	Ⓓ
8	Ⓐ	Ⓑ	Ⓒ	Ⓓ
9	Ⓐ	Ⓑ	Ⓒ	Ⓓ
10	Ⓐ	Ⓑ	Ⓒ	Ⓓ

Year 12 General Mathematics Assessment Task 1 2006/07

Question No. 1 — Solutions and Marking Guidelines

Outcomes Addressed in this Question

P5 represents the relationships between quantities in graphical form

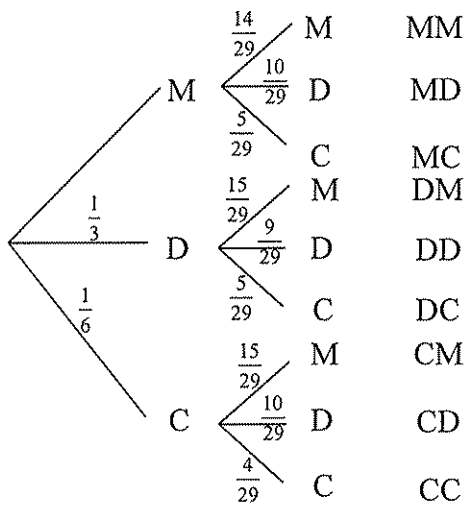
Outcome	Solutions	Marking Guidelines
P5	**(a)** Depth of Snow (cm)	**2 marks** Completes all values in cumulative frequency column correctly **1 mark** one value of cumulative frequency column incorrect or missing. **0 marks** More than one error in completing cumulative frequency column.
P5	**(b)/(c)** 	**(b) 1 mark** Completes cumulative frequency histogram correctly as on diagram (Histogram completed correctly using incorrect values from (a)) **(c) 2 marks** Correctly constructs ogive **1 mark** Single error in constructing ogive eg. joins centre top of each column, joins ogive back to snow depth axis
P5	**(d)** Reading from the graph: (i) Median = 155 cm (ii) Q1 = 85 cm (iii) Q3 = 200 cm	**1 mark** Correct value of median, error < 10cm **1 mark** Correct value of Q1, error < 10cm **1 mark** Correct value of Q3, error < 10cm
P5	**(e)** Interquartile Range = Q3 – Q1 = 200 – 85 = 115 cm	**2 marks** Correct solution **1 mark** Incorrect solution but shows how interquartile range is obtained

Depth (cm)	Frequency	Cumulative Frequency
0-49	8	8
50-99	9	*17*
100-149	12	*29*
150-199	16	*45*
200-249	7	*52*
250-299	4	*56*
300-349	2	*58*
350-399	2	60

Year 12 General Mathematics Assessment Task 1 2006/07		
Question No. 2	Solutions and Marking Guidelines	

Outcomes Addressed in this Question

H10 Solves problems involving uncertainty using basic principles of probability
H11 uses mathematical argument and reasoning to evaluate conclusions drawn from other sources, communicating his/her position clearly to others

Outcome	Solutions	Marking Guidelines
H10	**(a)** 	**2 marks** Shows full diagram including all outcomes for each draw and relevant probability for each branch of the tree. **1 mark** Shows all outcomes on tree but all or some of the probabilities are missing or incorrect.
H10	**(b) (i)** $P(MM) = \frac{1}{2} \times \frac{14}{29}$ $= \frac{14}{58}$ $= \frac{7}{29}$	**1 mark** Correct solution.
H10	**(ii)** $P(\text{at least 1 D}) = (\frac{1}{2} \times \frac{10}{29}) + (\frac{1}{3} \times \frac{15}{29}) + (\frac{1}{3} \times \frac{9}{29}) + (\frac{1}{3} \times \frac{5}{29}) + (\frac{1}{6} \times \frac{10}{29})$ $= \frac{49}{87}$	**2 marks** Correct solution. **1 mark** Shows the probability as a sum of individual probabilities of selections with dark chocolates.
H11	**(c)** Reasoning is not correct as Sydney's rainfall is seasonal. More rain can be expected in some months more than others.	**2 marks** Correct conclusion justified with logical reasoning. **1 mark** Shows some understanding that probability is not related to average number of rain days.
H10, H11	**(d)** $P(\text{6 with 1 die}) = \frac{1}{6}$ $P(\text{score 6 with 2 dice}) = \frac{5}{36}$ $\therefore$ There is more chance of rolling a 6 on a single die.	**2 marks** Correct conclusion justified with clear and correct probability for each outcome. **1 mark** Correct conclusion without giving both probabilities or full justification.
H10	**(e)** $P(\text{at least 1 H}) = 1 - P(\text{TTT})$ $= 1 - (\frac{1}{2})^3$ $= 1 - \frac{1}{8}$ $= \frac{7}{8}$	**1 mark** Correct solution.