



CATHOLIC SECONDARY SCHOOLS ASSOCIATION
2008 TRIAL HIGHER SCHOOL CERTIFICATE EXAMINATION
GENERAL MATHEMATICS – MARKING GUIDELINES/SOLUTIONS

Section 1

Question 1 – Question 22(1 mark each)

Question	Answer	Content	Syllabus Assessed	Targeted Performance Bands
1	B	M1: Units of measurement	P2, P5	2-3
2	B	FM1: Earning money	P2, P7, P8	2-3
3	A	AM1: Basic algebraic skills	P2,	2-3
4	B	DA2: Data collection & sampling	P1, P9, P11	3-4
5	D	M2: Applications of area and volume	P2	3-4
6	D	M7: Spherical geometry	H2, H6, H7	3-4
7	C	PB2: Relative Frequency & Probably	P2, P10	3-4
8	B	M1: Units of measurement	P2, P7	3-4
9	A	FM3: Taxation	P2, P7, P8	4-5
10	D	DA4: Summary statistics	P2	3-4
11	C	FM2: Investing money	P2, P3, P7	4-5
12	C	FM4: Credit & borrowing	H1, H2, H5, H8	3-4
13	C	M5: Further applications of area & volume	H2, H5, H6, H7	4-5
14	A	AM2: Modelling and linear relationships	P2, P5	4-5
15	D	AM4: Modelling linear and non-linear relationships	H2, H3	4-5
16	A	DA5: Interpreting sets of data	H1, H2, H4, H5	4-5
17	A	DA7: Correlation	H1, H2, H4, H5	4-5
18	B	PB3: Multi-stage events	H2, H3, H10	4-5
19	C	FM5: Annuities & loan repayments	H1, H5, H8	4-5
20	B	M6: Applications of trigonometry	H2, H7, H11	5-6
21	D	PB2: Relative Frequency & Probably	P2, P10	5-6
22	B	PB4: Applications of probability	H2, H4, H10	5-6

DISCLAIMER

The information contained in this document is intended for the professional assistance of teaching staff. It does not constitute advice to students. Further it is not the intention of CSSA to provide specific marking outcomes for all possible Trial HSC answers. Rather the purpose is to provide teachers with information so that they can better explore, understand and apply HSC marking requirements, as established by the NSW Board of Studies

No guarantee or warranty is made or implied with respect to the application or use of CSSA Marking Guidelines in relation to any specific trial exam question or answer. The CSSA assumes no liability or responsibility for the accuracy, completeness or usefulness of any Marking Guidelines provided for the Trial HSC papers.

Section II

Question 23 (13 marks)

Content: M2: Applications of area and volume

Outcomes assessed: P2, P6, P7.

Targeted Performance Bands: 3-4

	Solution	Criteria	Mark
23(a)(i)	$ \begin{array}{ccc ccc} & & D & & & & \\ & & 125 & & & & \\ C & 26 & 64 & 36 & 50 & B & \\ & & 0 & & & & \\ & & A & & & & \end{array} $	2 marks for correct answer 1 mark for either correct traverse values or correct offset position and values	2

Content: M2: Applications of area and volume

Outcomes assessed: P2, P6, P7

Targeted Performance Bands: 3-4

	Solution	Criteria	Marks
23(a)(ii)	Area of $\triangle ADC = \frac{1}{2} \times 125 \times 26$ $= 1625 \text{ m}^2$ Area of $\triangle ADB = \frac{1}{2} \times 125 \times 50$ $= 3125 \text{ m}^2$ $\therefore$ Total area $= 1625 + 3125$ $= 4750 \text{ m}^2$	2 marks for correct answer 1 mark for one correct calculation of the area of a triangle	2

Content: PB3: Multi-stage events

Outcomes assessed: H2, H3, H10

Targeted Performance Bands: 4-5

	Solution	Criteria	Mark
23(b)	$9 \times 8 \times 16 = 1152$	2 marks for correct answer. 1 mark for working towards a correct answer.	2

DISCLAIMER

The information contained in this document is intended for the professional assistance of teaching staff. It does not constitute advice to students. Further it is not the intention of CSSA to provide specific marking outcomes for all possible Trial HSC answers. Rather the purpose is to provide teachers with information so that they can better explore, understand and apply HSC marking requirements, as established by the NSW Board of Studies

No guarantee or warranty is made or implied with respect to the application or use of CSSA Marking Guidelines in relation to any specific trial exam question or answer. The CSSA assumes no liability or responsibility for the accuracy, completeness or usefulness of any Marking Guidelines provided for the Trial HSC papers.

Content: M4: Right-angled triangles
Outcomes assessed: P2, P3, P6, P7, P11
Targeted Performance Bands:3-4

	Solution	Criteria	Mark
23(c)(i)	Let d be the horizontal distance. $\tan 36^\circ 27' = \frac{6000}{d}$ $d = \frac{6000}{\tan 36^\circ 27'}$ $= 8123.3508$ $= 8123 \text{ m}$	2 marks for correct solution 1 mark for correct use of tan ratio leading to incorrect solution	2

Content: M1: Units of measurement
Outcomes assessed: P2, P5, P7
Targeted Performance Bands: 3-4

	Solution	Criteria	Mark
23(c)(ii)	Time = $\frac{D}{S}$ $= \frac{8123}{140}$ $= 58.02142857$ $= 58 \text{ s}$	1 mark for correct solution or solution based on their previous answer.	1

Content: DA3: Displaying single data sets
Outcomes assessed: P1, P9, P11
Targeted Performance Bands: 3-4

	Solution	Criteria	Mark
23(d)	Sector or Divided Bar graph. These best represent categorical data.	2 marks for correct answer and reason. 1 mark for part of answer correct.	2

Content: FM2: Investing money
Outcomes assessed: P2, P3, P7
Targeted Performance Bands:4-5

	Solution	Criteria	Mark
23(e)	$A = P(1 + r)^n$ $= 3.60(1.025)^3$ $= 3.8768$ $= \$3.88$	2 marks for correct equation and substitution to gain correct answer. 1 mark for partial correct work.	2

DISCLAIMER

The information contained in this document is intended for the professional assistance of teaching staff. It does not constitute advice to students. Further it is not the intention of CSSA to provide specific marking outcomes for all possible Trial HSC answers. Rather the purpose is to provide teachers with information so that they can better explore, understand and apply HSC marking requirements, as established by the NSW Board of Studies

No guarantee or warranty is made or implied with respect to the application or use of CSSA Marking Guidelines in relation to any specific trial exam question or answer. The CSSA assumes no liability or responsibility for the accuracy, completeness or usefulness of any Marking Guidelines provided for the Trial HSC papers.

Question 24 (13 marks)

Content: DA3: Displaying single data sets

Outcomes assessed: P1, P4, P9

Targeted Performance Bands: 3-4

	Solution	Criteria	Mark
24(a)(i)	26	1 mark for one correct answer.	1

Content: DA3: Displaying single data sets

Outcomes assessed: P1, P4, P9

Targeted Performance Bands: 3-4

	Solution	Criteria	Mark
24(a)(ii)	If $24 - 17 = 7 = f$ $B = 7 \times 27 = 189$	1 mark for one correct answer.	1

Content: M6: Applications of trigonometry

Outcomes assessed: H2, H6, H7, H11

Targeted Performance Bands: 4-5

	Solution	Criteria	Mark
24(b)	$\cos \angle STR = \frac{69^2 + 81^2 - 137^2}{2 \times 69 \times 81}$ $= \frac{-7447}{11178}$ $= -0.6662193595$ $\angle STR = 131.7759395$ $= 132^\circ$	2 marks for correct solution 1 mark for use of cosine rule leading to incorrect solution	2

Content: AM1: Basic algebraic skills

Outcomes assessed: P2, P7

Targeted Performance Bands: 4-5

	Solution	Criteria	Marks
24(c)	$\frac{5(x+1)}{15} - \frac{3(2x-8)}{15} = \frac{15}{15}$ $5(x+1) - 3(2x-8) = 15$ $5x + 5 - 6x + 24 = 15$ $-x = -14$ $x = 14$	3 marks for correct working and answer. 2 marks for correct elimination of the denominator. 1 mark for partial correct work.	3

DISCLAIMER

The information contained in this document is intended for the professional assistance of teaching staff. It does not constitute advice to students. Further it is not the intention of CSSA to provide specific marking outcomes for all possible Trial HSC answers. Rather the purpose is to provide teachers with information so that they can better explore, understand and apply HSC marking requirements, as established by the NSW Board of Studies

No guarantee or warranty is made or implied with respect to the application or use of CSSA Marking Guidelines in relation to any specific trial exam question or answer. The CSSA assumes no liability or responsibility for the accuracy, completeness or usefulness of any Marking Guidelines provided for the Trial HSC papers.

Content: FM4: Credit & borrowing
Outcomes assessed: H1, H2, H5, H8
Targeted Performance Bands: 3-4

	Solution	Criteria	Marks
24(d)(i)	$I = Prn$ $= 12000 \times 0.0925 \times 4$ $= 4440$ $\text{repayment} = \frac{12000 + 4440}{48}$ $= \$342.50$	3 marks for correct substitutions and answer. 2 marks for correct interest and partial correct work. 1 mark for progress towards the answer.	3

Content: FM1: Earning money, M1: Units of Measurement
Outcomes assessed: P1, P2, P7, P8
Targeted Performance Bands: 3-4

	Solution	Criteria	Mark
24(d)(ii)	$35\% = \$342.50$ $1\% = \$9.78571$ $100\% = \$978.57$	1 mark for correct answer.	1

Content: FM6: Depreciation
Outcomes assessed: H1, H5
Targeted Performance Bands: 4-5

	Solution	Criteria	Mark
24(d)(iii)	$S = V_0(1 - r)^n$ $= 12000(0.85)^4$ $= \$6264.08$	2 marks for correct substitution into equation and correct answer. 1 mark for progress towards answer.	2

DISCLAIMER

The information contained in this document is intended for the professional assistance of teaching staff. It does not constitute advice to students. Further it is not the intention of CSSA to provide specific marking outcomes for all possible Trial HSC answers. Rather the purpose is to provide teachers with information so that they can better explore, understand and apply HSC marking requirements, as established by the NSW Board of Studies

No guarantee or warranty is made or implied with respect to the application or use of CSSA Marking Guidelines in relation to any specific trial exam question or answer. The CSSA assumes no liability or responsibility for the accuracy, completeness or usefulness of any Marking Guidelines provided for the Trial HSC papers.

Question 25 (13 marks)

Content: FM3: Taxation

Outcomes assessed: P2, P5, P7, P8

Targeted Performance Bands: 3-4

	Solution	Criteria	Marks
25(a)(i)	$\text{taxable income} = 86458 - 2500$ $= 83958$ $\text{tax payable} = (83958 - 75000) \times 0.40 + 17100$ $= (8958 \times 0.40) + 17100$ $= \$20683.20$	2 marks for correct working and answer. 1 mark for partial correct work.	2

Content: FM3: Taxation

Outcomes assessed: P2, P5, P7, P8

Targeted Performance Bands: 3-4

	Solution	Criteria	Marks
25(a)(ii)	$\$83958 \times 0.015 = \1259.37	1 mark for correct answer.	1

Content: FM3: Taxation

Outcomes assessed: P2, P5, P7, P8

Targeted Performance Bands: 4-5

	Solution	Criteria	Marks
25(a)(iii)	$\text{PAYE} = 833.97 \times 26$ $= 21683.20$ $\text{Difference} = (20683.20 + 1259.37) - 21683.20$ $= 259.37$ $\therefore \text{Lynne will receive a refund of } \259.37	2 marks for correct working and answer. 1 mark for partial correct work.	2

DISCLAIMER

The information contained in this document is intended for the professional assistance of teaching staff. It does not constitute advice to students. Further it is not the intention of CSSA to provide specific marking outcomes for all possible Trial HSC answers. Rather the purpose is to provide teachers with information so that they can better explore, understand and apply HSC marking requirements, as established by the NSW Board of Studies

No guarantee or warranty is made or implied with respect to the application or use of CSSA Marking Guidelines in relation to any specific trial exam question or answer. The CSSA assumes no liability or responsibility for the accuracy, completeness or usefulness of any Marking Guidelines provided for the Trial HSC papers.

Content: M7: Spherical geometry
Outcomes assessed: H2, H6, H7, H11
Targeted Performance Bands: 4-5

	Solution	Criteria	Marks
25(b)	Angular distance = $105 - 0 = 105^\circ$ Time difference = $\frac{105}{15} = 7$ hours Time of departure (London) = 6:40pm Time of departure (Ho Chi Minh) = 6:40 pm + 7 hours = 18:40 + 7 = 25:40 = 1:40 am (next day) Time of arrival (Ho Chi Minh) = 1:40 am + 16 h 15 min = 17:55 = 5:55 pm (next day)	4 marks for correct solution 3 marks for one incorrect step in solution (either angular distance, time difference, time of departure in Ho Chi Minh City or time of arrival) 2 marks for two correct steps 1 mark for one correct step	4

Content: M5: Further applications of area & volume
Outcomes assessed: H2, H6, H7
Targeted Performance Bands: 4-5

	Solution	Criteria	Mark
25(c)(i)	Volume = $\frac{1}{3} \pi r^2 h$ $= \frac{1}{3} \times \pi \times 3.5^2 \times 12$ $= 153.93804$ $= 154 \text{ cm}^3$	2 mark for correct answer 1 mark for progress towards correct answer	2

Content: M5: Further applications of area & volume
Outcomes assessed: H2, H6, H7
Targeted Performance Bands: 4-5

	Solution	Criteria	Marks
25(c)(ii)	Volume = $\frac{4}{3} \pi r^3$ $= \frac{4}{3} \times \pi \times 3.5^3$ $= 179.59438$ $= 180 \text{ cm}^3$	2 mark for correct answer 1 mark for progress towards correct answer	2

DISCLAIMER

The information contained in this document is intended for the professional assistance of teaching staff. It does not constitute advice to students. Further it is not the intention of CSSA to provide specific marking outcomes for all possible Trial HSC answers. Rather the purpose is to provide teachers with information so that they can better explore, understand and apply HSC marking requirements, as established by the NSW Board of Studies

No guarantee or warranty is made or implied with respect to the application or use of CSSA Marking Guidelines in relation to any specific trial exam question or answer. The CSSA assumes no liability or responsibility for the accuracy, completeness or usefulness of any Marking Guidelines provided for the Trial HSC papers.

Question 26 (13 marks)

Content: PB2: Relative Frequency and Probability

Outcomes assessed: P2, P10

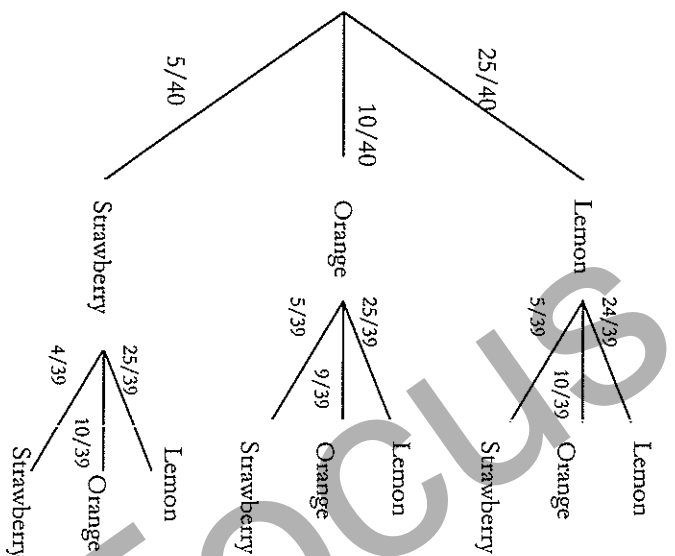
Targeted Performance Bands: 3-4

	Solution	Criteria	Marks
26(a)(i)	$P(\text{lemon}) = \frac{25}{40}$ $= \frac{5}{8}$	1 mark for correct answer.	1

Content: PB3:1 Multi-stage events

Outcomes assessed: H2, H3, H10

Targeted Performance Bands: 4-5

	Solution	Criteria	Marks
26(a)(ii)		2 marks for correct diagram. 1 mark for working towards a correct diagram.	2

DISCLAIMER

The information contained in this document is intended for the professional assistance of teaching staff. It does not constitute advice to students. Further it is not the intention of CSSA to provide specific marking outcomes for all possible Trial HSC answers. Rather the purpose is to provide teachers with information so that they can better explore, understand and apply HSC marking requirements, as established by the NSW Board of Studies

No guarantee or warranty is made or implied with respect to the application or use of CSSA Marking Guidelines in relation to any specific trial exam question or answer. The CSSA assumes no liability or responsibility for the accuracy, completeness or usefulness of any Marking Guidelines provided for the Trial HSC papers.

Content: PB3:1 Multi-stage events
Outcomes assessed: H2, H3, H10
Targeted Performance Bands: 4-5

	Solution	Criteria	Mark
26(a)(iii)	$P(L/L) = \frac{5}{8} \times \frac{24}{39} = \frac{5}{13}$ $P(O/O) = \frac{10}{40} \times \frac{9}{39} = \frac{3}{52}$ $P(S/S) = \frac{5}{40} \times \frac{4}{40} = \frac{1}{80}$ $P(\text{same flavour}) = P(L/L) + P(O/O) + P(S/S)$ $= \frac{5}{13} + \frac{3}{52} + \frac{1}{80} = \frac{473}{1040}$ $= 45.5\%$	2 marks for correct working and answer. 1 mark for partial correct work.	2

Content: DA6: The Normal Distribution
Outcomes assessed: H4, H5, H9
Targeted Performance Bands: 4-5

	Solution	Criteria	Marks
26(b)(i)	$z = \frac{\bar{x} - x}{s}$ $2.5 = \frac{x - 1.03}{0.015}$ $0.0375 = x - 1.03$ $x = 1.03 + 0.0375$ $x = 1.0675\text{kg}$	1 mark for correct answer.	1

Content: DA6: The Normal Distribution
Outcomes assessed: H4, H5, H9
Targeted Performance Bands: 3-4

	Solution	Criteria	Marks
26(b)(ii)	$z = \frac{\bar{x} - x}{s}$ $= \frac{1.0 - 1.03}{0.015}$ $= \frac{-0.03}{0.015}$ $= -2$	1 mark for correct answer.	1

DISCLAIMER

The information contained in this document is intended for the professional assistance of teaching staff. It does not constitute advice to students. Further it is not the intention of CSSA to provide specific marking outcomes for all possible Trial HSC answers. Rather the purpose is to provide teachers with information so that they can better explore, understand and apply HSC marking requirements, as established by the NSW Board of Studies

No guarantee or warranty is made or implied with respect to the application or use of CSSA Marking Guidelines in relation to any specific trial exam question or answer. The CSSA assumes no liability or responsibility for the accuracy, completeness or usefulness of any Marking Guidelines provided for the Trial HSC papers.

Content: D46: The Normal Distribution
Outcomes assessed: H4, H5, H9

Targeted Performance Bands: 4-5

	Solution	Criteria	Marks
26(b)(iii)	95%+2.5%=97.5%	2 marks for correct answer. 1 mark for progress towards answer.	2

Content: AM3: Algebraic skills and techniques
Outcomes assessed: H2

Targeted Performance Bands: 5-6

	Solution	Criteria	Marks
26(c)(i)	$r = \sqrt[3]{\frac{3V}{4\pi}}$	2 marks for correct working and answer. 1 mark for partial correct work.	2

Content: AM3: Algebraic skills and techniques
Outcomes assessed: H2, H11

Targeted Performance Bands: 4-5

	Solution	Criteria	Marks
26(c)(ii)	$r = \sqrt[3]{\frac{3 \times 1767}{4\pi}} = 7.499793..$ $= 7.5cm$	2 marks for correct substitution into equation and correct answer. 1 mark for progress towards answer.	2

DISCLAIMER

The information contained in this document is intended for the professional assistance of teaching staff. It does not constitute advice to students. Further it is not the intention of CSSA to provide specific marking outcomes for all possible Trial HSC answers. Rather the purpose is to provide teachers with information so that they can better explore, understand and apply HSC marking requirements, as established by the NSW Board of Studies

No guarantee or warranty is made or implied with respect to the application or use of CSSA Marking Guidelines in relation to any specific trial exam question or answer. The CSSA assumes no liability or responsibility for the accuracy, completeness or usefulness of any Marking Guidelines provided for the Trial HSC papers.