

B O A R D O F S T U D I E S
NEW SOUTH WALES

1999
SCHOOL CERTIFICATE
TEST REPORT

MATHEMATICS

Includes:

- **Answers**
- **Markers' comments**
- **Sample responses**
- **Test statistics**

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1 Introduction

The purpose of this report is to provide teachers with specific feedback on the responses of candidates to the questions on the 1999 School Certificate Mathematics Test. The report shows teachers:

- those questions candidates found easy and those questions they found difficult;
- the correct answer(s) for each question and the common mistakes made by candidates.

For questions 76 to 80, the marking criteria and short summaries of markers' comments are also provided.

2 Overview of the 1999 School Certificate Mathematics Test

The 1999 School Certificate Mathematics Test was attempted by approximately 81 000 candidates on Tuesday, 9th November.

The Mathematics Test consisted of two written sections of 2 hours total working time. Candidates were allowed 30 minutes of working time on Section 1 and 90 minutes of working time on Section 2. Calculators were not to be used in Section 1, and the questions in this section tested number sense and mental computation. This section reinforced the Years 9 and 10 syllabus statement that 'students maintain and develop their mental arithmetic skills, rather than relying on their calculators for every calculation'. The questions in this part included multiple-choice and short free-response questions. Some questions were designed to have more than one correct answer.

Candidates were able to use calculators in Section 2 of the School Certificate Mathematics Test. This section consisted of two parts. Part A had 50 one-mark items. Part B consisted of five free-response questions, each worth five marks.

Overall, candidates seemed well prepared for the test format, question types and length. Most candidates seemed to allow adequate time to complete both sections, and non-attempts on questions in Section 2 Part B were not common.

A significant number of candidates, however, misread the instructions after Question 69 and so failed to answer the six remaining diagram completion questions. Steps were taken during and after the marking operation to identify these candidates and adjust their mark appropriately.

Also noticeable was the large number of candidates who clearly did not have some or all of the permitted geometrical instruments: ruler, pair of compasses, protractor and set squares. There were several questions that required such equipment, and candidates for future tests would be well advised to ensure that they have all necessary equipment.

3 Reporting Mathematics for the School Certificate

As part of the changes to the School Certificate adopted by the New South Wales Government, students received their own results for the tests. Achievement was reported against standards achieved by students. This was done through the use of band descriptions. These describe what students, typically, know, understand and can do at six different levels or bands. Band 6 is the highest performance level, and students in this band attained marks of between 90 and 100. The next level of performance is band 5, and students reported in this band achieved marks from 80 to 89. Bands 4, 3 and 2 correspond to mark ranges 70 to 79, 60 to 69, and 50 to 59, respectively. A mark of 50 corresponds to the minimum standard expected. Students reported in band 1 achieved below that standard in the 1999 School Certificate Mathematics Test.

The band descriptions reproduced below were used both to set standards and to report student achievement.

Band descriptions – Mathematics School Certificate Test

A typical performance in this band is demonstrated when a student:

Band 6 90 – 100	Communicates extensive mathematical knowledge and understanding effectively using words, numbers, pronumerals, graphs and diagrams. Selects and uses mathematical techniques across a wide range of topic areas. Solves problems that involve several steps and interprets information presented in a variety of forms such as graphs, diagrams or algebraic expressions. Shows a high level of competence with respect to number sense by using and moving between different representations such as integers, fractions, decimals and percentages. Estimates and interprets answers in context. Extends and generalises given patterns. Analyses statistical and geometrical data and draws conclusions with justification.
Band 5 80 – 89	Communicates substantial mathematical knowledge and understanding effectively using words, numbers, pronumerals, graphs and diagrams. Selects and uses mathematical techniques across a range of topic areas. Uses a variety of strategies to solve both routine and unfamiliar problems. Shows well developed computation skills including estimation and calculation with integers, fractions, decimals and percentages. Extends given patterns to determine a particular term.
Band 4 70 – 79	Communicates substantial mathematical knowledge and skills such as recall and use of geometrical facts and properties. Displays competency in number skills by calculating with integers, decimals, fractions and percentages. Chooses appropriate strategies in solving familiar problems such as those involving area, volume and statistics. Extends given patterns for several terms.
Band 3 60 – 69	Recalls and communicates mathematical knowledge such as geometrical facts and properties. Displays competency in number skills when calculating with whole numbers, decimals and percentages. Solves problems in familiar contexts such as those involving chance and data, and measurement.
Band 2 50 – 59	Recognises mathematical symbols and common geometrical shapes. Completes some calculations with whole numbers and decimals. Solves routine problems such as those involving money and time. Reads from, and plots data on, familiar graphs. Determines the next term in a given pattern.

4 Test Statistics


The test was marked out of 100, and the raw mean was 54.

The percentage of candidates in each band is given in the table below.

Band	Percentage of total candidature
6	8.3
5	21.9
4	26.1
3	26.3
2	15.8
1	1.6

1999 School Certificate Mathematics Test – Table of Question Difficulties

The following table shows a measure of the difficulty of questions on the 1999 School Certificate Mathematics Test. For ease of interpretation, the questions have been placed in one of ten groups. Group 1 contains the easiest questions and Group 10, the most difficult.

Group		Questions
1	Easiest  Most difficult	2, 31, 44, 77(a)
2		18, 24, 27, 28, 32, 35, 37, 41, 45, 49, 63, 77(b), 78(a)
3		26, 71
4		1, 4, 6, 8, 11, 13, 25, 33, 46, 51, 67, 76(a)
5		3, 7, 9, 12, 17, 38, 39, 48, 65, 66, 72, 79(a), 79(b), 80(a)
6		5, 14, 23, 29, 47, 50, 53, 59, 61, 68, 70, 76(b), 77(c), 77(e), 78(b), 79(c)(i), 80(b)
7		10, 36, 52, 57, 76(d), 77(d), 78(d), 79(c)(ii)
8		15, 16, 20, 42, 69, 73, 74, 75, 76(c), 78(c)
9		19, 30, 34, 54, 56, 60, 62, 76(e), 78(e), 79(d), 80(d)
10		21, 22, 40, 43, 55, 58, 64, 80(c)

5 Answers, Markers' Comments and Sample Responses

Section 1 (non-calculator section)

(Mean mark: 14 out of 25)

Question	Answer(s)	Percentage correct	Markers' comments and common incorrect answers (with percentages choosing distractors)
1	A	70	B(1%), C(27%), D(2%)
2	D	89	A(1%), B(5%), C(4%)
3	B	61	A(7%), C(14%), D(17%)
4	B	71	A(11%), C(15%), D(2%)
5	D	55	A(13%), B(20%), C(11%)
6	B	70	A(12%), C(8%), D(9%)
7	D	64	A(25%), B(6%), C(5%)
8	C	73	A(8%), B(14%), D(4%)
9	C	58	A(10%), B(12%), D(20%)
10	C	47	A(20%), B(5%), D(28%)
11	D	68	A(9%), B(8%), C(14%)
12	A	58	B(27%), C(11%), D(4%)
13	27	69	This question was well answered. Thirty minutes was a common incorrect answer obtained by calculating the time difference between 8:47 and 9:17.
14	\$15	50	Many candidates multiplied $2\frac{1}{2}$ by 600 to obtain 1500.
15	9 or 10 or 11 or 12 or 13 or 14 or 15	41	This question was poorly answered. Some candidates multiplied 61 by $\frac{4}{7}$. Many candidates misread the question and gave answers such as 5, 6, 305 or 306.
16	24	40	Answers such as 2, 3, 7, 9 and 12 were common.
17	10%	59	This question was well answered, with the most common incorrect response of 110% resulting from misreading the question.
18	-6°	85	The answer 6 was also accepted.
19	\$2	27	This question was poorly done, with well over 50% of candidates giving their answer as \$4.
20	\$700	43	A common answer was \$1400. Some candidates gave two answers, one for each package. Many candidates did not notice that their answers were unrealistic.
21	32	17	This question was poorly done, with a common incorrect answer being 30. Again, common sense did not always prevail, with many candidates giving answers less than 24.

Question	Answer(s)	Percentage correct	Markers' comments and common incorrect answers <i>(with percentages choosing distractors)</i>
22	117	9	There was a wide variation in the interpretation of what was required in this question. Many candidates gave 13 as their answer, which is the next number in the pattern.
23	<i>A and D</i>	53*	Answer (C) was frequently given.
24	<i>A and C</i>	83*	(A) alone was also accepted, as the almost vertical lines in the distance – time graph for (C) could be interpreted as making (C) unacceptable.
25	<i>B and D</i>	73*	This question was well answered.

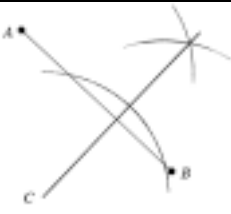
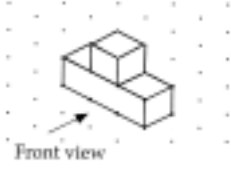
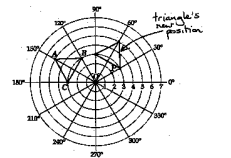
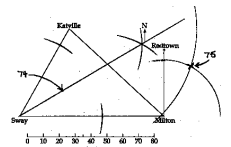
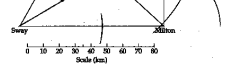
* The percentage correct quoted for these questions is the mean mark for the question, expressed as a percentage.

Section 2 Part A

(Mean mark: 27 out of 50)

Question	Answer(s)	Percentage correct	Markers' comments and common incorrect answers (with percentages choosing distractors)
26	B	78	A(17%), C(3%), D(3%)
27	Both A and B were accepted	84	C(12%), D(3%)
28	D	80	A(12%), B(5%), C(2%)
29	C	55	A(41%), B(1%), D(2%)
30	C	29	A(19%), B(39%), D(13%)
31	C	91	A(1%), B(3%), D(4%)
32	D	83	A(5%), B(9%), C(3%)
33	B	74	A(17%), C(4%), D(4%)
34	C	33	A(8%), B(55%), D(3%)
35	A	83	B(8%), C(4%), D(5%)
36	A	46	B(28%), C(15%), D(10%)
37	D	82	A(2%), B(8%), C(7%)
38	B	60	A(14%), C(21%), D(4%)
39	A	65	B(15%), C(9%), D(10%)
40	D	17	A(7%), B(68%), C(8%)
41	D	82	A(2%), B(4%), C(12%)
42	A	42	B(7%), C(39%), D(12%)
43	D	19	A(17%), B(24%), C(40%)
44	C	92	A(2%), B(3%), D(3%)
45	C	83	A(2%), B(3%), D(12%)
46	A	73	B(13%), C(8%), D(5%)
47	A	53	B(16%), C(10%), D(21%)
48	B	60	A(10%), C(17%), D(12%)
49	C	80	A(3%), B(4%), D(13%)
50	B	56	A(23%), C(15%), D(5%)
51	8.14	67	This question was well answered, with the most common incorrect answers being 8.12, 8.13, 8.15, 8.3 and 81.4
52	55°	44	10°, 35°, 45° and 305° were common incorrect answers. Many candidates did not realize that an anti-clockwise rotation was possible.
53	20 hours	50	As the information in the question was given in minutes, many candidates calculated in minutes and did not convert their answer to hours. 48 hours was a common incorrect answer, as was 12 hours, presumably obtained from 1200 minutes.

Question	Answer(s)	Percentage correct	Markers' comments and common incorrect answers (with percentages choosing distractors)
54	36	33	Some candidates interpreted edges as faces and gave 14 as their answer. Many others misread the question as 'how many new edges does the shape have' and gave 24.
55	6	21	The most frequent incorrect answers were powers of 2, with 32 being the most common. 4, 5, 7 and 8 were also given by many candidates.
56	10:21	33	Many candidates seemed unaware of the possibility of changing trains at a station, and so 10:00 was a common incorrect answer, as were 10:57, 11:15, 11:22, 11:27 and 11:57.
57	15°C	48	This question was not well answered. 20°, 25°, 30° and 35° were common incorrect answers.
58	11	15	This question required candidates to exercise careful attention to detail. The stem-and-leaf plot had the smallest data entries at the bottom, and candidates had to work carefully through the two sets of data in a consistent way to correctly find the medians.
59	10 800 000	50	This question was poorly answered, with responses such as 3 600 007, 3 600 007.2, 7 236 000, 36 000 072 exposing students' difficulty with the interpretation of large numbers given in different forms.
60	20.0	33	12.7, 12.8, 17.6 and 21.2 were common incorrect answers. Many candidates did not round off to one decimal place.
61	9 or 16 or 21 or 24 or 25	54	50 was the most common incorrect answer.
62	24 m ²	30	Many answers consisted of some or all of the given numbers being multiplied or added. 9, 30 and 40 were common incorrect answers.
63	15 km	80	Many markers noted how well candidates answered this question. (Either they catch taxis regularly or have a facility for practical questions involving money!)
64	4 cm	20	9 was the most common incorrect answer. Other incorrect answers were 4.5 and 9.38 (the latter obtained by applying Pythagoras' theorem to 9 and 13).
65	C and D	64	This question was well answered.
66	B and C and D	58	Many candidates seemed to be under the impression that questions of this type have a maximum of two correct answers.
67	B and C	70	This question was well answered.

Question	Answer(s)	Percentage correct	Markers' comments and common incorrect answers <i>(with percentages choosing distractors)</i>
68	A and D	55	Many candidates gave B as one of their answers, possibly not noticing the exponent '2' on C^2 .
69	A and C	38	Despite the reluctance of many candidates to choose more than two answers, a considerable number of candidates chose all four answers here.
70		55	Many candidates confused 'perpendicular', 'parallel' and 'vertical'. Another common error was to create a right-angled triangle using AB as the hypotenuse, or to join C to A and C to B . A number of candidates drew a line from C bisecting the interval AB .
71		77	This was the best answered construction question, and tested spatial understanding rather than the use of geometrical instruments. (Also, geometrical instruments were not needed here.)
72	(2, 210°)	65	The answer $(-2, 210^\circ)$, given by a large proportion of the candidates, was accepted.
73		38	Many candidates did not take care when plotting the vertices of the triangle in its new position. Candidates who correctly drew the triangle after a 90° <u>anti</u> -clockwise rotation were also awarded the mark.
74		39	The most common errors in this question were those brought about by misinterpretation of the instruction 'bisects the angle'. Many candidates drew the median or altitude from Sway. Those candidates who used geometrical instruments in their constructions were much more likely to obtain the correct answer. There seemed many candidates who did not have geometrical instruments; some even writing 'no compass' on the test booklet.
75		41	Once again, candidates were at a disadvantage answering this question without a pair of compasses. While some latitude for measurement error was given, wild guesses were invariably outside this range. As in Question 74, candidates who used geometrical instruments in their constructions were much more likely to obtain the correct answer.

Section 2 Part B

Mean mark 13 out of 25

Question 76 (5 marks)

(Mean mark: 2.3 out of 5)

Mark	Percentage of candidates
5	16
4	17
3	14
2	13
1	16
0	25

General comments

- This question was poorly done by a large number of candidates.
- Many candidates seemed unfamiliar with dot plots and their interpretation.

Question 76 (a)

Answer

20 games

Marking criteria

Candidates were asked to determine the number of games represented in a dot plot. The mark was awarded for the correct answer, 20.

Percentage correct

67

Markers' comments

- The most common answer to this part was 7, showing a lack of understanding of what the dots in the dot plot represented.
- A number of candidates who did attempt to count the number of dots in the dot plot did so incorrectly and obtained answers ranging from 17 to 22.

Sample responses

(The following are examples of responses which were awarded one mark. This list does not attempt to be comprehensive. There may have been other examples of candidate responses which were also awarded the mark. Also, in many parts of questions an incorrect answer may have been awarded the mark if it was consistent with the candidate's previous answer. This principle reflects a desire to reward what candidates can do, rather than penalize one mistake several times over related parts of a question.)

1 mark was gained by candidates who gave the following responses:

- 20 games
- They played 20 games
- 20
- Twenty
- Stephen's team played a number of games but the total was 20 games

No marks were awarded to candidates who gave the following responses:

- Six games
- 8 games
- Stephen's team played 7 full games of soccer
- 5
- Eighteen
- 22
- 10 games
- Seventeen
- Stephen's team played 8 games

Question 76 (b)

Answer

5

Marking criteria

Candidates were asked to determine the median number of goals scored per game. The mark was awarded for the correct answer, 5, or a numerical expression indicating that the candidate had correctly identified the tenth and eleventh terms, such as 5, 5 or $(5 + 5) \div 2$.

Percentage correct

50

Markers' comments

Many of the candidates who thought there were 7 games gave 4 as their answer for the median number of goals scored per game.

Sample responses

1 mark was gained by candidates who gave the following responses:

- 5 goals
- 5
- 5 goals per game
- $5 + 5 \div 2 = 5$
- $10 \div 2 = 5$

No marks were awarded to candidates who gave the following responses:

- Two, three, four, and five goals
- Their median number of goals was 4.3
- = 10
- 3
- It was 6 goals
- 2.9
- 10.5
- Two goals
- 20
- 10, 11
- 2 goals per game
- The median number of goals scored per game was 4
- 2–3 goals per game
- 20 of the median number of goals scored per game
- 2, 3
- 11
- 43
- 0, 2, 2, 2, 2, 3, 4, 5
- Median = 6
- The median was 2.5
- 3, 4
- 1.2
- 7

Question 76 (c)

Answer

4.3

Marking criteria

The mark for this part was awarded for the correct average number of goals scored per game (4.3), or a numerical expression for the average, correct or consistent with the candidate's answer to part (a), eg $\frac{0 \times 2 + 2 \times 2 + 3 \times 2 + 4 \times 3 + 5 \times 4 + 6 \times 5 + 7 \times 2}{\text{candidate's answer part (a)}}$.

Percentage correct

40

Sample responses

1 mark was gained by candidates who gave the following responses:

- 4.3
- $86 \div 20 = 4.3$, 4 goals per game
- $4 + 6 + 12 + 20 + 30 + 14 \div 20 = 72.7$

No marks were awarded to candidates who gave the following responses:

- 0.3, 0.5, 0.6, 0.8
- = 2.9 (plus the goals divide by how many there is)
- 3
- 2.4
- 1.4
- 6.05
- 2.9
- 0.4
- 4.8
- 9.7
- 4.1
- 2.8
- 4.4
- 2.9 goals per game
- $2 + 2 + 2 + 3 + 4 + 5 + 2 \div 6 = 3.6$
- 15.3
- 0.2
- The average number of goals scored per game to one decimal place is 2
- 29
- 12.3
- 2.5 goals scored per game
- 2 goals had been in 4 times in the same
- 2.1
- 4.6
- 14.2
- 3.4
- 0.9
- $\frac{1}{2}$ per game
- Five
- 4 goals is average
- 10
- 1
- 3.7 goals per game
- 35 goals
- 20, 1
- 13
- 5.8

- 2.57
- 4.9 goals per game
- 15.7
- 5.3 goals
- 1.572
- 15 was the average number of goals scored
- 0.2 goals
- 8

Question 76 (d)

Answer

35%

Marking criteria

The mark for this part was awarded for the correct answer, 35%, a correct numerical expression for this answer, or an answer that was consistent with the candidate's answer to part (a), ie $(7 \div \text{candidate's answer part (a)}) \times 100$.

Percentage correct

45

Sample responses

1 mark was gained by candidates who gave the following responses:

- $\frac{7}{20} = 0.35 = 35\%$
- 35%
- 35% of games
- 0.35

No marks were awarded to candidates who gave the following responses:

- 5%
- $6 + 7 = 13$, 0.5%
- 10%
- 71%
- 30%
- None
- 25%
- 80%
- 29%
- 12.5%
- 40% of games scored 6 or more goals
- 33%
- 30
- 14%

- 1%
- 8%
- 3 – 4
- 0, the most scored was 5 goals in game 6
- 70%
- 27%
- 51%
- 8.1%
- 15%
- 8.8%
- 50%
- 6
- 1.2%
- 0.08%
- 72 goals out of 7 games
- 5.6%
- 7.76%
- In their 6th game
- 39.8
- 1.4%
- 10

Question 76 (e)

Answer

72°

Marking criteria

The mark for this part was awarded for the correct answer, 72°, a correct numerical expression for this answer, or an answer that was consistent with the candidate's answer to part (a), ie $(4 \div \text{candidate's answer part (a)}) \times 360^\circ$.

Percentage correct

29

Markers' comments

Many candidates incorrectly multiplied $\frac{5}{20} \times 360^\circ$ to obtain 90°, not realising that it is the four times that 5 goals were scored that determines the angle at the centre of the sector graph.

Sample responses

1 mark was gained by candidates who gave the following responses:

- 72°
- 72%

- 72 degrees / Acute angle
- $\frac{4}{20} \times 100 = \frac{400}{20} = 20\%$, $\frac{20}{100} \times \frac{360}{1} = 72^\circ$
- $\frac{4}{20} = \frac{1}{5}$, $\frac{360}{5} = 72^\circ$
- No marks were awarded to candidates who gave the following responses:
 - 25°
 - 5°
 - 90°
 - 6
 - 50° (they were scored) (.5 goals)
 - Straight angle
 - 70°
 - Acute
 - 45°
 - 15.6 degrees
 - 1
 - 22°
 - 55°
 - 150°
 - Right angle
 - Acute angle
- The angle of the graph would represent a $\frac{1}{4}$ for the 5 goals scored
 - 6°
 - 30°
 - 18°
 - 6 had been done 50 goals
 - 40°
 - 5.8°
 - 135°
 - 126°
 - 23%
 - 7 times
 - 63°
 - Angle obtuse
 - 51%
 - 75°
 - Line graph
 - 90% angle
 - 144°

Question 77 (5 marks)

(Mean mark: 3.3 out of 5)

Mark	Percentage of candidates
5	33
4	17
3	14
2	19
1	10
0	6

General comments

Candidates generally performed well in this question, displaying an understanding of the underlying concepts of distance, petrol consumption and cost.

Question 77 (a)

Answer

930 km

Marking criteria

Candidates were awarded the mark for the correct answer or a correct numerical expression leading to the correct answer, such as 465×2 .

Percentage correct

92

Markers' comments

This part was very well done, with the vast majority of candidates correctly answering the question.

Sample responses

1 mark was gained by candidates who gave the following responses:

- 930 km
- 930 litres
- $30 \text{ L} = 465 \text{ km}$, $60 \text{ L} \times 2 = 930 \text{ km}$
- $30 \times 2 = 60$ so $465 \times 2 = 930 \text{ km}$
- $465 \times 2 = 930 \text{ km}$
- $465 + 465 = 930 \text{ km}$ using 60 L
- $465 \times 2 = 5130 \text{ km}$

No marks were awarded to candidates who gave the following responses:

- 13 950 litres of petrol by travelling 465 km
- 495 km
- 465 km
- 912 km
- 216 225 km
- 0.064 is the maximum distance
- 216 225
- 100 km
- 27 900 km
- 565 km
- 232.5 km
- 525 km
- 90 litres
- 15.5 km

Question 77 (b)

Answer

15.5 km per litre

Marking criteria

Answers from 15 to 16 were awarded the mark, as were correct numerical expressions and answers that were correct from candidates answer to part (a), ie answer to part (a) \div 60.

Percentage correct

81

Markers' comments

Again, most candidates seemed to have a clear idea of what was required, though many rounded both up and down to the nearest whole number.

Sample responses

1 mark was gained by candidates who gave the following responses:

- 15.5 km
- $465 \div 30$, 15.5 km
- $30 \div 30 = 1$ per litre so $465 \div 30 = 15.5$
- 15.7 km
- 15.51 cm
- 16
- 15.2 km
- $465 \div 30 = 15.5$

No marks were awarded to candidates who gave the following responses:

- 465 km
- 1
- 70 litres
- 0.002
- 0.5 litres
- 93 metres
- 60
- 348
- 20 litres
- 0.06 / litre
- 3 km
- 120 km per litre of petrol
- 5 litres
- 0.06 km
- 65 km

Question 77 (c)

Answer

6.5 litres

Marking criteria

Candidates were rewarded if they demonstrated an understanding of the concept of litres per 100 km. There were many methods of calculating this value, and due to the various roundings of part (b), answers between 6.2 and 6.7 were accepted. Correct numerical expressions such as $30 \div 4.65$ were awarded the mark, as were answers that were consistent with the candidates answers to part (b), ie $100 \div$ answer part (b).

Percentage correct

55

Markers' comments

Some candidates, despite the instruction to answer correct to one decimal place, gave answers that were a bald whole number, such as 6. These answers, with no supporting working or numerical expressions, were not rewarded.

Sample responses

1 mark was gained by candidates who gave the following responses:

- $30 \text{ L} \div 465 \text{ km} \times 100 \text{ km} = 6.5 \text{ L}$
- 6.4 L
- $6.2 \text{ litres} = 99.2$
- 6.5 c
- $100 \div 15 = 6.4 \text{ litres of petrol for } 100 \text{ km}$

- 6.7 litres
- 6.45 L

- No marks were awarded to candidates who gave the following responses:
- 0.21 L
- 7.7 litres
- 1.5 L
- 3.35
- 4.7
- 10 L
- 7.1 litres
- 15.5 litres
- 8 litres
- 36 litres
- 4.65
- 64.516
- 1550 L
- $90 \text{ litres} = 1395 + 10 \text{ litres} = 155 = 1550.0$
- 33 litres
- 99 litres
- 29.7 litres
- 645.2 L
- 3.3 L
- 74.3
- 64.5
- $15.5 \times 6 = 93 \text{ km}$ is the closest
- 5
- 99.9 litres
- 0.3 L
- 1.6 litres
- 3 litres
- 99.6
- 14
- 7.5
- 33 L
- 1441.5
- 0.155 litres
- 80
- 1600 L
- $15.5 \times 100 = 1550 \text{ litres}$
- 65 litres
- 139.5 L
- 5.6 litres
- 139.5 km
- 20.00
- 155 km

Question 77 (d)

Answer

\$4.54 or \$4.51

Marking criteria

Candidates were awarded the mark for correctly calculating the cost of petrol needed to travel 100 km. As there was a range of possible answers for part (c), a corresponding range of answers was accepted for part (d), as well as correct numerical expressions and answers that, while outside the accepted range, were consistent with candidates' answers to part (c), ie answer to part (c) \times 69.9 cents or answer to part (c) \times \$0.699.

Percentage correct

47

Markers' comments

- Many candidates were unsure how to deal with the decimal fraction of a cent, and so there was some confusion whether they were answering in dollars or cents.
- Many candidates rounded to the nearest 5 cents.

Sample responses

1 mark was gained by candidates who gave the following responses:

- \$4.47 cents
- 450.85
- \$4.54 = 454 c
- \$4.50 cents
- \$4.54
- 454.35 cents
- \$4.47
- \$4.50
- 451 c
- \$4.55

No marks were awarded to candidates who gave the following responses:

- \$450.97
- \$35.00
- \$328.5
- 0.699
- 1083.45 cents
- \$45.40
- 69.9 cents \times 100 km = 6990 cents
- \$6.80
- \$10.83
- 2.21
- \$1.10

- \$20.97
- \$468.33
- $69.9 \times 1465 = 4886.0$
- \$45.45
- \$69.90
- \$23.70
- \$454.40
- \$44.52
- \$6990
- \$45.00
- 6×15.5 is the most to travel in 100 km
- \$209.70
- \$1.12
- \$14.30
- \$40.00
- \$8.40
- \$5.20
- \$17.60
- \$699.0
- \$559.20
- 76.20
- \$111840.0
- 9.59
- \$97.51
- \$64.80
- \$391.44
- \$69900
- \$454.35
- 11.47
- \$44.16
- \$6.99, \$7.00
- \$16.07
- \$10.90
- $7.5 \times 69.9 = 524.25$ c
- \$70.00
- \$69.90 or 6990 cents
- \$108.34
- \$132.96
- \$45.44c
- \$69.90 petrol needed to travel 100 km
- 69.90

Question 77 (e)

Answer

732 km

Marking criteria

Candidates were awarded the mark for an answer within a certain range of the correct answer (732 km), or a correct numerical EXPRESSION for this answer, such as $\frac{305}{30} \times 72$.

Percentage correct

51

Markers' comments

While this question was well done, many candidates rounded off intermediary results obtained. Candidates would be well advised to leave intermediary results of calculations on their calculator screens or in calculator memory, as they are often required later in the same or a subsequent question part.

Sample responses

1 mark was gained by candidates who gave the following responses:

- 10 km/litre, 732 km
- $122 + 610 = 732$ km
- $305 \div 30 = 10.2$ $30 + 30 = 60$
- $12 \times 10.2 = 122.4$ $305 + 305 = 610$
- $610 + 122.4 = 732.4$ km
- 732.29 km
- 732 km
- 732
- 732.04 km
- 734.4

No marks were awarded to candidates who gave the following responses:

- 21 960 km
- 60 L = 610 km, 70 L
- 635.4 km
- 21 960 km
- 307 km
- 233 litres
- 407 km
- 100 km
- 720 km
- 762.5 km
- 21.96
- 762.5 km travelled with 72 litres of petrol

- 630.3
- 60 litres = 610 km
- 2.4
- 465 km
- 760 km
- 7321 cm
- 731.52 km
- 538 km
- 359
- 856 km
- 347 km
- 737 km
- 850 km
- 707 km
- 630
- 72 litres = 736.0
- 400 km
- 720 km
- 650 km
- 360 km
- It can travel 625 km on a full tank
- 711.6 km
- 686.25 km
- 746 km
- $305 \times 2 = 610 + 76.3 = 686.3$ km
- 621.77 km
- $305 + 305 + 12 = 622$
- 641 km
- 355 km
- 610.04
- 160 km
- 727 km
- 731.2 km

Question 78 (5 marks)

(Mean mark: 2.7 out of 5)

Mark	Percentage of candidates
5	17
4	19
3	20
2	20
1	15
0	10

General comments

This question enabled the better candidates to perform well, while most candidates were able to obtain one or more marks. Candidates found parts (b) and (c) the most difficult.

Question 78 (a)

Answer

12 grams

Marking criteria

Candidates were awarded the mark for the answer, 12. Units (grams) were not required here.

Percentage correct

82

Markers' comments

Some candidates, perhaps thinking that reading 12 grams off the label was too easy, added the weights of the listed components. These weights did not add to 12 grams!

Sample responses

1 mark was gained by candidates who gave the following responses:

- 12 g
- 12
- 12 grams
- 11.871 g (rounded up to 12 g)

No marks were awarded to candidates who gave the following responses:

- 11.871 grams
- 300 g

- $1.0 + 2.4 + 7.5 + 0.8 + 0.58 = 12.28$ g
- 2.4 g
- 2.1 grams
- 7.5
- 11.7
- 2.08 g
- 62 grams
- 8 grams are there in one serving of noodles
- $12 \times 25 = 300$ g
- 57.2 g
- 112 g
- 108.9
- 97.2 g
- 2 g
- 0.2%
- $1.0 + 2.4 + 7.5 + 0.8 = 11.7$ g
- 6

Question 78 (b)

Answer

20%

Marking criteria

The correct percentage (20) was awarded the mark, as was a correct numerical expression such as $2.4 \div 12 \times 100$.

Percentage correct

51

Markers' comments

There were a number of ways of calculating the answer to this part, and candidates could have saved some time by recognising that 20 grams of fat were in 100 grams of noodles, giving 20% without the need for a calculation.

Sample responses

- $\frac{2.4}{12} \times 100 = 20\%$ fat

1 mark was gained by candidates who gave the following responses:

-
- 20%
- 20 grams
- 20 g of the percentage are in the noodles

- $20 \times 3 = 60 \quad \frac{60}{300} = \frac{1}{5} \times 100 = \frac{100}{5} = 20\%$
- 20

No marks were awarded to candidates who gave the following responses:

- 4.46%
- 2%
- 28.8%
- 2.4
- 15%
- 2.4 grams
- 5.12
- 1430 mg
- 0.2%
- 20.2%
- 2.4%
- 0.48%
- 2.88
- 2.88^{-03}
- 6.7%
- 5%
- 28%
- $2.4 \times 12 \div 100 = 0.28\%$
- 24%
- Percentage of fat is 5%
- $2.4 \times 2 \times 100, 49.4\%$
- 4
- 0.288%
- 6
- 0.6%
- 0.3%
- 4%
- 5.76%
- 10.4%
- 5.7%
- 28.8%
- 0.18%
- 6%
- 1.2
- 14%
- 18.5%
- 2.4 g

Question 78 (c)

Answer

60 grams

Marking criteria

The mark was awarded for 60 or a correct numerical expression, such as 2.4×25 .

Percentage correct

43

Markers' comments

Surprisingly, candidates found this part difficult, perhaps due in part to the distinction between servings (12 g), 100 g and packages.

Sample responses

1 mark was gained by candidates who gave the following responses:

- 60
- 60 grams
- $2.4 \times 25 = 60$ grams
- $12 \times 25 = 300$ g. There is 60 g of fat in the package.

No marks were awarded to candidates who gave the following responses:

- 22.4 g
- 20 g
- 20 g per 100 g / 2.4 g per 12 g
- $2.4 + 20$ g = 22.4 g
- 20 grams
- 22.4 grams of fat
- 2%
- 1430 mg
- 6 grams
- 2.4
- 240 grams
- 22.4
- 2.4 grams
- 30 g \times 3 = 90 g
- 5 grams of fat in the package
- 2.4 g the total number of grams of fat in the package
- 300
- 5%
- 13
- 8%
- 7.2%
- 2000 g

- 0.8%
- 22.4 g
- 41%
- 600 g
- 21 g
- 41.6 g
- 7.2 g
- 20%
- 4.8 g

Question 78 (d)

Answer

5.5 minutes, or 5 minutes and 30 seconds

Marking criteria

The correct answer, or an equivalent expression, was required.

Percentage correct

47

Markers' comments

This part was well done.

Sample responses

1 mark was gained by candidates who gave the following responses:

- 5 minutes 30 seconds
- $55 \text{ calories} \div 10 \text{ calories} = 5.5$
- It would take James 5.5 minutes to use the calories from a serving of noodles
- $5\frac{1}{2}$ mins
- $55 \div 10 = 5.5$, $5\frac{1}{2}$ mins 330 mins
- 5.5 minutes
- 5 mins 30 secs
- 5.5 m, $55 \div 10$
- 5 and a half mins
- Five minutes and thirty seconds
- $10 \text{ c} = 1$, $20 \text{ c} = 2$, $30 \text{ c} = 3$, $40 \text{ c} = 4$, $50 \text{ c} = 5$, $55 \text{ c} = 5\frac{1}{2}$ minutes

No marks were awarded to candidates who gave the following responses:

- 69 min
- 15 minutes
- About 6 minutes
- 2 minutes
- 1.2 mins
- 2 hours at least to burn all the fat
- 7 minutes
- 5 mins 50 secs
- 5:50
- 5 minutes and 50 seconds
- 5.30 mins
- 24 minutes
- 0.02
- 55 minutes
- 4 min and 30 sec
- 5 minutes and 5 seconds
- 45 minutes and 70 seconds
- 5 minutes and a little more
- 55 calories
- 20 minutes
- ∴ 15 minutes
- 5 mins 12 sec
- 5.2 minutes
- 550
- 10 mins
- 12 mins
- 30 mins
- 5 mins & 60 seconds
- 45 minutes
- 6 mins
- 50.5 mins
- 55 calories = 12 g = 1 pack
- 25 mins
- 1.02 mins
- 11 minutes
- 55 mins

Question 78 (e)

Answer

16 grams

Marking criteria

A range of answers was accepted, due to the alternative ways of calculating the number of grams of noodles needed, and interim roundings.

Percentage correct

32

Markers' comments

Many candidates, after obtaining an answer of 16.14 ..., rounded up to 17 grams rather than down to the nearest gram, 16 grams. So, 17 grams was a popular incorrect answer.

Sample responses

1 mark was gained by candidates who gave the following responses:

- 15.6 g
- 16 grams
- 59 g, $171 = 12 \text{ g} + 4.1$, 16 grams
- 16 g
- $\frac{12}{171} \times 230 = 16 \text{ mg}$
- 16
- 16.14 grams
- 16.14
- 16.1 g
- 59 mg, 14.25 per gram, 16.1 grams

No marks were awarded to candidates who gave the following responses:

- 24.5 g
- 19.2 g
- Less than two packets
- 2.3 grams
- 24 g
- 0.23 g
- 100 g
- 241 g
- 200
- 59 more mg
- $1\frac{1}{3}$ of a packet
- 46.8 g
- 18 grams

- 15 grams
- 19.1 g (to 1 dec. pl.)
- 2.89
- $\frac{171}{230} \times 100 = 74.35\%$ of daily requirement
- 33
- 19 grams
- 17 g
- 13 g (nearest gram)
- 21 grams
- $230 - 171 = 59$
- $230 - 171 = 59$ mg, Answer = 12 grams
- 1.3450292
- 59 g of sodium is in 1 serving of noodles
- 192 g
- 0.23 grams of noodles would need to be eaten
- 14.2 g
- About a packet and a half
- 14 g
- 231 grams
- 130 grams
- 20 g
- 1.7 g
- 2 grams
- $1\frac{1}{4}$ servings, 213.75 grams
- $\frac{171}{12} = 14.25$ $\frac{230}{14.25} = 16$ g
- 38 packets
- 1.3 grams
- 3278 g
- 21.4 packets
- 22 grams
- 240 g
- 171 mg
- $171 \div 12 = 14.25 \times 59 = 840.75$, 841 grams
- 2 and $\frac{1}{2}$ packets of noodles a day
- 36 g
- 10206.0 grams
- 2.5 grams
- 105 grams
- 1.4 g
- 14 grams
- 5750 grams to be eaten daily to meet daily requirements
- 30 gms

Question 79 (5 marks)

(Mean mark: 2.5 out of 5)

Mark	Percentage of candidates
5	20
4	17
3	12
2	17
1	19
0	16

General comments

Many candidates did not realise that parts (a) and (b) were related to parts (c) and (d), nor that part (d) was related to part (c).

Question 79 (a)

Answer

(C) right-angled and scalene.

Marking criteria

Candidates had to select the correct description of a given triangle from four choices, and indicate this by writing down the corresponding letter of their choice, or rewriting the description.

Percentage correct

66

Markers' comments

- A small proportion of the candidates, perhaps thinking that this part was an example of a multiple-choice question which may have more than one possible answer, gave two answers, usually B and C.
- Some candidates chose and wrote a letter (A, B, C or D) and then followed this by a word description from another letter.

Sample responses

1 mark was gained by candidates who gave the following responses:

- Right-angled and scalene
- C
- (C) Right-angled and scalene

No marks were awarded to candidates who gave the following responses:

- (A) Right-angled and isosceles
- The triangle is a right angled isosceles
- A
- Write angled isosceles

Question 79 (b)

Answer

$$AC^2 = 16^2 + 30^2 \text{ or } 34^2 = 16^2 + 30^2$$

Marking criteria

Candidates were required to show that AC was 34 cm either by using Pythagoras' theorem, or by using an argument based on scale, or by measuring an angle and using trigonometry.

Percentage correct

59

Markers' comments

- Many candidates did not know what was meant by "show", and very few candidates used correct setting out. Some candidates thought "show" merely meant "label".
- Most candidates recognised this question as a Pythagoras' theorem question.

Sample responses

1 mark was gained by candidates who gave the following responses:

- $a^2 = b^2 + c^2$
 $AC = 16^2 + 30^2$
 $= 256 + 900$
 $= 1156$
 $= \sqrt{1156}$
 $\therefore AC = 34 \text{ cm}$
- $16^2 + 30^2 = 1156$
 $\sqrt{1156} = 34$
- $AB = 16$ $AC^2 = 16^2 + 30^2$
 $BC = 30$ $AC^2 = 1156$
 $AC = 34$

- $30^2 + 16^2 = 34^2$
 $c^2 = a^2 + b^2$
- $AC = \sqrt{16^2 + 30^2}$
 $AC = 34 \text{ cm}$
- The length would be $16^2 + 30^2 = 1156$, then a square root of 1156 is 34, using Pythagoras theorem
 $a^2 = 16^2 + 30^2$
 $= 256 + 900$
• $= 1156$
 $a = 34$
using Pythagoras' theorem

No marks were awarded to candidates who gave the following responses:

- A to C is 34 cm
- $30 + 7 = 37 - 3 = 34 \text{ cm}$
- $16 + 30 = 46$
- $AC = 34 \text{ cm}$
- $30 + 16 + 34 = 80 \text{ cm}$, Anything below 90° is an acute triangle
- $30 + 16 \div 2 = 23$
- $5.2 \times 6.4 = 33.28$ (a) 34 cm
- Right-angled triangle is equal to 90° and if you make AC 34 cm it will not be a right angled triangle
- $34 = 16^2 + 30^2$
- $30 + 4 = 34 \text{ cm}$
- It equals that because AB is 16 cm and BC is 30 cm. When AB, AC and BC are added up they equal 80 cm.
- 34 cm

Question 79 (c)(i)

Answer

(A) 454

Marking criteria

Candidates had to calculate the area of a semicircle drawn on triangle ABC and choose the appropriate alternative from four given answers. Candidates needed to choose alternative A, or nominate 454 as the area of the semicircle.

Percentage correct

51

Sample responses

1 mark was gained by candidates who gave the following responses:

- (A) 454
- A

No marks were awarded to candidates who gave the following responses:

- D
- B
- C
- (B) 908
- 908 cm^2
- $C = 1816$
- (D) 3236
- 1816
- (C) 1816
- $B = 908 \text{ cm}^2$

Question 79 (c) (ii)

Answer

694 cm^2

Marking criteria

Candidates needed to calculate the area of triangle ABC (240 cm^2) and add this to their answer for 79 part (c) (i). An error in 79 (c) (i) was not penalized twice, so that answers that were correct from the previous answer were awarded the mark.

Percentage correct

44

Markers' comments

Many candidates failed to add the areas for their semicircle and triangle.

Sample responses

1 mark was gained by candidates who gave the following responses:

- $454 + 240 = 694 \text{ cm}^2$
- $16 \times 30 \div 2 + 908 \text{ cm}^2 = 1147.9 \text{ cm}^2$
- 694 cm (to the nearest cm)
- 693.96 cm^2
- $\frac{1}{2} 30 \times 16 = 240 + 1816 = 2056 \text{ cm}^2$
- 2055.8 cm^2

No marks were awarded to candidates who gave the following responses:

- 240 cm
- 480
- 480 cm^2
- $16 \text{ cm} \times 30 \text{ cm}$
- 100 cm
- 240 cm^2
- $16 \times 30 \times 908 = 4348$
- 100%
- The whole semicircle is shaded
- 3.63
- 934 cm^2
- 3236 cm^2
- $100\% - 480 \text{ cm}^2$
- 23
- 100
- 46 cm
- 242.1 cm
- 500 cm^2
- 19 cm^2
- $A^2 = 16^2 + 30^2$
- The shaded area is 908
- 76 cm^2
- 36
- 20 cm^2
- 534 cm^2
- 95 cm
- 235.2
- 14 cm
- 500

Question 79 (d)

Answer

$27\,760 \text{ cm}^3$

Marking criteria

Candidates had to calculate the volume of a container in the shape of a prism. The area of the base of this prism had been asked for in part 79 (c) (ii), so the answer to (c) (ii) $\times 40$ was sufficient for the award of the mark for this part.

Percentage correct

34

Markers' comments

Many candidates did not obtain the correct answer for this part, even after correctly calculating the shaded area in 79(c)(ii). On the whole, this part was poorly done.

Sample responses

1 mark was gained by candidates who gave the following responses:

- $694 \text{ cm}^2 \times 40 \text{ cm} = 27\,760 \text{ cm}^3$
- $693.96 \times 40 = 27\,758 \text{ cm}^3$
- $1148 \times 40 = 4592 \text{ cm}^3$
- $1147.9 \times 40 = 45\,916 \text{ cm}^3$
- $A \text{ of shaded} \times 40 = 27\,750 \text{ cm}^3$
- $V = 27\,760 \text{ cm}^3$
- $1028 \times 40 = 41\,120 \text{ cm}^3$

No marks were awarded to candidates who gave the following responses:

- 80 cm^2
- $V = A \times 40$
- 86 cm
- $0.4 \text{ cubic centimetres}$
- 100 cm^3
- 40 c
- 1216
- 10 cm
- $72\,640 \text{ cm}^2$
- $19\,200 \text{ cm}^3$
- 160 cm^3
- 400 cm^3
- 174 cm
- $40 \times 3.142 = 125.66$
- 120 cm^3
- $694 \times 40 \div 2, 13880$
- $100\,531 \text{ cm}^3$
- 258 cm^3
- 123 cm^3
- 40 cm^3
- 16 cm^2
- 1600
- 9105 cm^3
- 326 cm^3
- $454 \times 2 = 908 + 40 = 948 \text{ cm}^2$
- 40.00
- $12\,566 \text{ cm}^3$
- 160 cm^2
- 125.6 cm^3
- $36\,320$
- $40 \times 40 = 1600$

Question 80 (5 marks)*(Mean mark: 1.9 out of 5)*

Mark	Percentage of candidates
5	14
4	11
3	6
2	24
1	16
0	30

General comments

Many candidates were able to give numerical answers to parts (a) and (b), but found generalising these numerical results into an algebraic rule very difficult.

Question 80 (a)**Answer**

36

Marking criteria

Candidates had to calculate the number of dots (36) on the outer surface of four cubes joined together in a line. Candidates with a correct numerical expression were also awarded the mark.

Percentage correct

66

Markers' comments

Candidates found this part straightforward.

Sample responses

1 mark was gained by candidates who gave the following responses:

- 36
- $28 + 8 = 36$
- $8 \times 4 = 32$, $32 + 4 = 36$ dots on the outer surface
- $3 = 28$, $4 = 36$, just add 8 dots
- 36 dots if there were 4 cubes joined together
- $8 \times 4 + 4 = 36$ dots on the outer surface
- 36 dots (goes up by 8 dots every time a cube is added on)

No marks were awarded to candidates who gave the following responses:

- 20
- 38 dots
- 1
- 40
- 34 dots
- 38
- 34
- $28 + 10 = 38$ dots
- On the outer surface 32
- 33
- 14
- 32
- 44
- 28
- 22
- 40 dots
- 70
- There will be 38 dots on the outer surface
- There would be 20 dots
- 10
- 32 dots
- 34 dots altogether

Question 80 (b)

Answer

60

Marking criteria

A mark was awarded for the correct calculation of the number of dots on the outer surface of seven cubes joined in the same way. Candidates were also awarded the mark if their answer to part (a) was incorrect, but they added 24 to their previous answer.

Percentage correct

53

Markers' comments

Once again, candidates found this part reasonably straightforward, though numerical errors were all too frequent.

Sample responses

1 mark was gained by candidates who gave the following responses:

- 60
- 60 dots
- 60 dots on the outer surface
- $40 + 20 = 60$ dots
- $7 \times 2 = 14$, $14 \times 4 = 56$, $56 + 4 = 60$ dots on the outer surface
- 60 dots if there were 7 cubes joined together
- $8 \times 6 - 12 = 60$
- $36 + 8 + 8 + 8 = 60$, \therefore 60 dots on outer surface of 7 cubes joined
- 60 dots $(8 \times 7) \times 4$
- 60 dots on outer surface
- $8 \times 7 + 4 = 60$ dots on the outer surface

No marks were awarded to candidates who gave the following responses:

- 112
- 58 dots
- 68
- 52 dots
- 56
- 57 dots
- 92
- 52
- 88
- $38 + (7 \times 6) = 80$ dots
- 118
- 80 dots
- 62
- 96 dots on the outer surface
- 64 dots
- $7 \times 12 = 84$, $84 - 18 = 66$
- $7 = 64$, $3 \times 4 = 64$
- 72
- 100
- 66 dots
- 68 dots
- 12 dots
- 46
- 54
- 84 dots
- 108
- 68 dots on the outer surface
- There is 20 dots
- $7 \times 8 = 56$ There will be 56 dots
- 234 dots
- 67

Question 80 (c)

Answer

$$8n + 4$$

Marking criteria

Candidates were awarded the mark for correctly formulating the expression for the number of dots on the outer surface of n cubes joined in a similar way to the earlier parts. The expression $8n + 4$ or its algebraic equivalent was required.

Percentage correct

18

Markers' comments

Most candidates found this part very difficult, and did not seem to understand what was being asked of them. The concept of an algebraic expression seemed to have eluded these candidates, with comments like "what is n ?" written in the answer space.

Sample responses

1 mark was gained by candidates who gave the following responses:

- $8n + 4$
- $D = 8n + 4$
- $2(4n + 2) = \text{no. of dots}$
- $8n + 4 = \text{number of dots}$
- $n \times 8 + 4$
- $2n \times 4 + 4$
- number of dots = $8n + 4$

No marks were awarded to candidates who gave the following responses:

- 124
- $8n$
- 71
- 72
- $2 \times 4n$
- 100 dots
- 10
- $2n - 8$
- $N \times 10 - 2$
- $8n + 12 = D$
- 938 dots
- $n \times n = n, n - n = n$
- $12n - (2n)$
- 40
- 28
- $n \times 10 \text{ dots}$

- $2 \times n \times 4 + 4$
- $60 + n$
- $n = \text{number of dice} \times 12 - 8$
- 236 dots
- 60 dots
- $(n \times 12) - ((n - 1) \times 4)$
- $n = 10$, 88 dots
- 24
- $n \text{ dots} \times 12$
- $n = 8 - 2$
- $2 \times 3 \times n = n$
- $d = 12n - 4$
- 110
- 12
- n^8
- 56
- number of dots + 8
- 46 dots
- $n + 8$
- 12 dots
- $n = \text{amount of cubes} \times 2 + 8$
- 106

Question 80 (d)

Answer

29

Marking criteria

Full marks (two marks) were awarded for the correct answer (29).

Candidates who did not succeed in obtaining this answer needed to equate their algebraic expression from 80 (c) to 236, and then solve this expression correctly for n , the number of cubes required. Candidates who were only able to do the first step successfully were awarded one mark out of a possible two.

Percentage correct

58

Markers' comments

Candidates used a variety of methods, including laborious 'trial and error' computations, solving simple or more complex equations. Many candidates did not show fully how they had arrived at their answer.

Sample responses

2 marks were gained by candidates who gave the following responses:

- 29 cubes joined together
- $236 - 4 = 8n + 4$
- $232 \div 8 = 8n \div 8$
- $n = 29$
- $8n + 4 = 236$ $8n = 232$ $n = 29$ 29 cubes are needed

No marks were awarded to candidates who gave the following responses:

- 33
- 29.5 cubes
- 30 cubes
- 1416 cubes are needed
- 18
- 12
- 3.8 cubes
- 29.5
- 71
- 39.3 cubes
- 25
- 15
- 117
- 25 cubes
- 54
- 23
- 58
- $2 \times 36 \times 4 + 4 = 1892$
- 22
- 78
- 32
- 30
- 19.67 cubes
- 28 cubes
- 59
- $236 \div 8 = 29.5 + 0.5 = 30$
- 14
- 50 cubes
- 40
- 39 cubes
- 19
- 47
- 240
- $236 \times 12 = 213$ There will be 21.3 cubes needed
- 30
- $(8 \times 236) + 4$
- $= 1892$
- 28 cubes there are 68 dots $= 8 \text{ cubes} \times 3 = 204$ 4 cubes = 28 cubes