

# Cambridge Lower Secondary Checkpoint

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**MATHEMATICS****1112/02**

Paper 2

**April 2020**

MARK SCHEME

Maximum Mark: 50

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**Published**

This mark scheme is published as an aid to teachers and learners, to indicate the requirements of the examination. However, we have not been able to adjust it to reflect the full range of answers that would have been seen as a part of the normal moderation and marking process, and it does not necessarily contain all the possible alternatives that might have arisen. Cambridge will not enter into discussions about the mark scheme.

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This document has **14** pages. Blank pages are indicated.

**General guidance on marking**

This section gives general guidelines on marking learner responses that are not specifically mentioned in the mark scheme. **Any guidance specifically given in the mark scheme supersedes this guidance.**

**Difference in printing**

It is suggested that schools check *their* printed copies for differences in printing that may affect the answers to the questions, for example in measurement questions.

**Mark scheme annotations and abbreviations**

<b>M1</b>	method mark
<b>A1</b>	accuracy mark
<b>B1</b>	independent mark
<b>FT</b>	follow through after error
dep	dependent
oe	or equivalent
cao	correct answer only
isw	ignore subsequent working
soi	seen or implied

**Brackets in mark scheme**

When brackets appear in the mark scheme this indicates extra information that is not required but may be given.

For example:

Question	Answer	Mark	Further Information
5	19.7 or 19.6(58)	1	

This means that 19.6 is an acceptable truncated answer even though it is not the correct rounded answer.

The ... means you can ignore any numbers that follow this; you do not need to check them.

Accept

- any correct rounding of the numbers in the brackets, e.g. 19.66
- truncations beyond the brackets, e.g. 19.65

Do not accept

- 19.68 (since the numbers in brackets do not have to be present but if they are, they should be correct).

**Number and place value**

The table shows various general rules in terms of acceptable decimal answers.

<b>Decimal Answers</b>
Accept omission of leading zero if answer is clearly shown, e.g. <b>.675</b>
Accept trailing zeros, unless the question has asked for a specific number of decimal places or significant figures, e.g. <b>0.7000</b>
Accept a comma as a decimal point if that is the convention that you have taught the learners, e.g. <b>0,638</b>

**Units**

For questions involving quantities, e.g. length, mass, money, duration or time, correct units must be given in the answer. Units are provided on the answer line unless finding the units is part of what is being assessed.

The table shows acceptable and unacceptable versions of the answer 1.85 m.

	<b>Accept</b>	<b>Do not accept</b>
If the unit is given on the answer line, e.g. ..... m	Correct conversions, provided the unit is stated unambiguously, e.g. .... 185 cm..... m (this is unambiguous since the unit cm comes straight after the answer, voiding the m which is now not next to the answer)	.....185..... m .....1850.....m etc.
If the question states the unit that the answer should be given in, e.g. 'Give your answer in metres'	1.85 1 m 85 cm	185; 1850 Any conversions to other units, e.g. 185 cm

**Money**

In addition to the rules for units, the table below gives guidance for answers involving money. The table shows acceptable and unacceptable versions of the answer \$0.30.

	<b>Accept</b>	<b>Do not accept</b>
If the amount is in dollars and cents, the answer should be given to two decimal places	\$0.30  For an integer number of dollars it is acceptable not to give any decimal places, e.g. \$9 or \$9.00	\$0.3  \$09 or \$09.00
If units are not given on the answer line	Any unambiguous indication of the correct amount, e.g. 30 cents; 30 c \$0.30; \$0-30; \$0=30; \$00:30	30 or 0.30 without a unit  \$30; 0.30 cents  Ambiguous answers, e.g. \$30 cents; \$0.30 c; \$0.30 cents (as you do not know which unit applies because there are units either side of the number)
If \$ is shown on the answer line	All unambiguous indications, e.g. \$.....0.30.....; \$.....0-30.....; \$.....0=30.....; \$.....00:30.....	\$.....30.....  Ambiguous answers, e.g. \$.....30 cents.....; \$.....0.30 cents..... <b>unless</b> units on the answer line have been deleted, e.g. \$.....30 cents.....
If cents is shown on the answer line	.....30.....cents	.....0.30.....cents  Ambiguous answers, e.g. .....\$30 .....cents; .....\$0.30 .....cents <b>unless</b> units on the answer line have been deleted, e.g. .....\$0.30.....cents

**Duration**

In addition to the rules for units, the table below gives guidance for answers involving time durations. The table shows acceptable and unacceptable versions of the answer 2 hours and 30 minutes.

Accept	Do not accept
Any unambiguous indication using any reasonable abbreviations of hours (h, hr, hrs), minutes (m, min, mins) and seconds (s, sec, secs), e.g. 2 hours 30 minutes; 2 h 30 m; 02 h 30 m	Incorrect or ambiguous formats, e.g. 2.30; 2.3; 2.30 hours; 2.30 min; 2 h 3; 2.3 h (this is because this indicates 0.3 of an hour - i.e. 18 minutes - rather than 30 minutes)
Any correct conversion with appropriate units, e.g. 2.5 hours; 150 mins <b>unless</b> the question specifically asks for time given in hours and minutes	02:30 (as this is a 24-hour clock time, not a time interval)  2.5; 150

**Time**

The table below gives guidance for answers involving time. It shows acceptable and unacceptable versions of the answer 07:30

	Accept	Do not accept
If the answer is required in 24-hour format	Any unambiguous indication of correct answer in numbers, words or a combination of the two, e.g. 07:30 with any separator in place of the colon, e.g. 07 30; 07,30; 07-30; 0730	7:30 7:30 am 7 h 30 m 7:3 730 7.30 pm 073 07.3
If the answer is required in 12-hour format	Any unambiguous indication of correct answer in numbers, words or a combination of the two, e.g. 7:30 am with any separator in place of the colon, e.g. 7 30 am; 7.30 am; 7-30 am  7.30 in the morning  Half past seven (o'clock) in the morning  Accept am or a.m.	Absence of am or pm 1930 am 7 h 30 m 7:3 730 7.30 pm

**Algebra**

The table shows acceptable and unacceptable versions of the answer  $3x - 2$ .

Accept	Do not accept
$x3 - 2$ ; $3 \times x - 2$	$3x + -2$ if it is supposed to be in simplest form
Case change in letters	
Changes in letters as long as there is no ambiguity	

Accept extra brackets when factorising, e.g.  $5(x + (3 + y))$ .

Teachers must mark the final answer given. If a correct answer is seen in working but final answer is given incorrectly then the final answer must be marked. If no answer is given on the answer line then the final line of the working can be taken to be the final answer.

**Inequalities**

The table shows acceptable and unacceptable versions of various answers.

For the following	Accept	Do not accept
For $6 \leq x < 8$	$[6, 8)$	$< x <$
For $x \leq -2$	$(-\infty, -2]$	$x < -2$
For $x > 3$	$(3, \infty)$ $3 < x$	Just '3' written on the answer line, even if $x > 3$ appears in the working

**Plotting points**

The table shows acceptable and unacceptable ways to plot points.

Accept	Do not accept
Crosses or dots plotted within $\pm \frac{1}{2}$ square of the correct answer  The graph line passing through a point implies the point even though there is no cross	A horizontal line and vertical line from the axes meeting at the required point

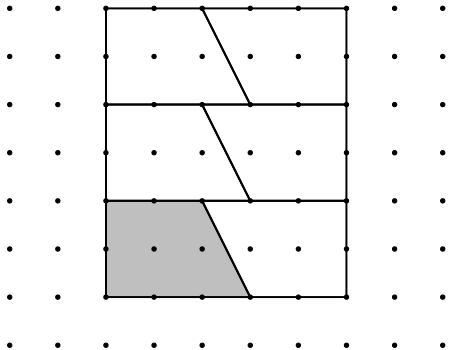
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Question	Answer	Mark	Further Information
1	8.6	1	Accept – 8.6 or $\pm 8.6$
2	$4f$ and $y + 7$ or $7 + y$	2	Accept $4 \times f$ and $f \times 4$
	$4f$ or $y + 7$ or $7 + y$	B1	
3	2 : 5 cao	1	
4	$(t = ) 10r$	1	Accept $10 \times r$ and $r \times 10$
5	3.22	2	Condone 3.2 Only allow 3 if correct method or more accurate answer seen in working.
	$1 \times 9 + 2 \times 14 + 3 \times 2 + 4 \times 12 + 5 \times 8 + 6 \times 5$	M1	soi by 161
6	420 and $\text{cm}^3$	2	Allow 0.00042 $\text{m}^3$
	420 or $\text{cm}^3$	B1	
7	5	1	
8	$(V = ) 36$	1	

Question	Answer	Mark	Further Information
9	Correct working, e.g.: <ul style="list-style-type: none"> <li>75 miles is 120-121 km</li> <li>115 km is 71-72 miles</li> <li>a conversion factor <b>and</b> comparison to <math>\frac{5}{8}</math> or <math>\frac{8}{5}</math></li> </ul>	1	e.g. $\frac{115}{75} = 1.533$ which is less than 1.6(09) $\frac{75}{115} = 0.652$ which is greater than 0.625 (or 0.621)
10	$4ab - 6a^2$	2	
	One correct term in the expansion i.e. $4ab$ or $-6a^2$	B1	
11	<div style="border: 1px solid black; padding: 2px; display: inline-block;">30</div> <b>and</b> <div style="border: 1px solid black; padding: 2px; display: inline-block;">400</div>	2	
	One correct answer	B1	
12	8 (kg)	2	
	a correct complete method e.g.: <ul style="list-style-type: none"> <li><math>256 \div 48 \times 1.5</math></li> <li><math>256 \div 32</math></li> </ul>	M1	



Question	Answer	Mark	Further Information
13	0.045 <b>and</b> 17 000	<b>2</b>	
	One correct answer	<b>B1</b>	
14	25.1(...) (cm)	<b>2</b>	Accept 25 cm for 2 marks if accompanied by working.
	$8 \times \pi$ oe	<b>M1</b>	
15	$(x =) -2$	<b>1</b>	Do not accept $9^{-2}$
16	D            C            A E            B	<b>2</b>	
	3 correct	<b>B1</b>	
17	$b(5b - 3)$	<b>1</b>	
18	3	<b>1</b>	

Question	Answer	Mark	Further Information
19(a)	$D = 12T$ oe	<b>1</b>	$D = 12 \times T$ $\frac{D}{12} = T, \frac{D}{T} = 12$ Condone $\frac{36}{3}$ in place of 12
19(b)	5.5	<b>1FT</b>	FT is from <i>their</i> linear formula connecting $T$ and $D$
19(c)	Straight line between (0, 0) and (10, 120) $\pm$ half a square	<b>1</b>	Follow through <i>their</i> (a) or (b) as long as the line is through the origin. e.g. a straight line from (0, 0) to (10 $\times$ <i>their</i> 12) e.g. a straight line from (0, 0) to ( <i>their</i> 5.5, 66) and extending this line across full range $0 \leq T \leq 10$
20	At least 5 more of the quadrilaterals drawn so that they tessellate e.g. . . . . . 	<b>1</b>	They must fit together with no gaps that could not be filled with the same quadrilateral.

Question	Answer	Mark	Further Information
21	X beside $(-2, -7)$	1	No mark if there is a cross in more than one box. Allow any unambiguous indication.
22	Use of the range to make a correct explanation, e.g. The range for Mondays (or 14) is smaller than the range for Thursdays (or 20)	1	Condone mention of the mean if the values of the ranges are compared.  Do not accept <ul style="list-style-type: none"> <li>the range is better on Monday</li> <li>an explanation that simply repeats the values of the range without a comparison.</li> </ul>
23	4.29 cao	1	
24	2.65 (tonnes)	1	
25	$5n - 2$	2	Do not accept $n = 5n - 2$ Allow equivalents e.g. $3 + (n - 1)5$
	$5n + c$ where $c$ is a constant	B1	$c$ may be 0
26	189.43 (NZ dollars)	2	Allow 189 or 189.4 or 189.43...
	$1000 \div 7.76$ or $1.47 \div 7.76$	M1	M1 implied by 129 or 128.865 (correctly rounded or truncated to 4sf or better) or 0.189(4...)

Question	Answer	Mark	Further Information
27	150(°)	<b>2</b>	
	$4 \times 180 \div 6$ <b>or</b> $180 - \frac{360}{6}$ <b>or</b> $90 + \frac{360}{6}$	<b>M1</b>	Implied by 120 seen (allow 60 and 60 on diagram).

Question	Answer	Mark	Further Information
28	67.3 (%) or 67.2...(%)	3	
	$\frac{(38 \times 49) + (12 \times 40) - (50 \times 28)}{(50 \times 28)} \text{ oe}$ <p>or</p> $\frac{(38 \times 49) + (12 \times 40)}{(50 \times 28)} \text{ oe}$	M2	$\frac{1862 + 480 - 1400}{1400}$ $\left(\frac{38}{50} \times \frac{49 - 28}{28}\right) + \left(\frac{12}{50} \times \frac{40 - 28}{28}\right)$ <p>Implied by 0.672...</p> $\frac{1862 + 480}{1400}$ $\left(\frac{38}{50} \times \frac{49}{28}\right) + \left(\frac{12}{50} \times \frac{40}{28}\right)$ <p>Implied by 1.672...</p>
	$\frac{49 - 28}{28} \text{ oe}$ <p>or</p> $\frac{40 - 28}{28} \text{ oe}$ <p>or</p> $(38 \times 49) + (12 \times 40) \text{ oe}$	M1	<p>Implied by 0.75</p> <p>Implied by 0.428...</p> <p>Implied by 2342</p> <p>Only award M1 if M2 not given.</p>

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Question	Answer	Mark	Further Information
29(a)	$(x =) 0.2$ oe	<b>2</b>	
	A correct method, e.g. <ul style="list-style-type: none"> <li><math>2x + 2x + x = 1</math> oe</li> <li><math>1 \div 5</math></li> </ul>	<b>M1</b>	
29(b)	0.6 oe	<b>1</b>	e.g. $\frac{3}{5}$ , $\frac{6}{10}$  Condone 3x  Follow through as 3 times <i>their</i> answer to (a), provided this gives a value between 0 and 1.
30	$(y =) \frac{x}{3}$ oe	<b>1</b>	
31	$(p - 8, q)$	<b>2</b>	
	$p - 8$ or $q$	<b>B1</b>	