OCR
Oxford Cambridge and RSA

GCSE

Mathematics (9-1)

Unit **J560/02:** Paper 2(Foundation Tier)

General Certificate of Secondary Education

Mark Scheme for June 2017

Annotations used in the detailed Mark Scheme.

Annotation	Meaning
✓	Correct
✗	Incorrect
BOD	Benefit of doubt
FT	Follow through
ISW	Ignore subsequent working (after correct answer obtained), provided method has been completed
M0	Method mark awarded 0
M1	Method mark awarded 1
M2	Method mark awarded 2
A1	Accuracy mark awarded 1
B1	Independent mark awarded 1
B2	Independent mark awarded 2
MR	Misread
SC	Special case
∧	Omission sign

Subject-Specific Marking Instructions

1. **M** marks are for <u>using a correct method</u> and are not lost for purely numerical errors.
    A marks are for an <u>accurate</u> answer and depend on preceding **M** (method) marks. Therefore **M0 A1** cannot be awarded.
    B marks are <u>independent</u> of **M** (method) marks and are for a correct final answer, a partially correct answer, or a correct intermediate stage.
    SC marks are for <u>special cases</u> that are worthy of some credit.

2. Unless the answer and marks columns of the mark scheme specify **M** and **A** marks etc, or the mark scheme is 'banded', then if the correct answer is clearly given and is <u>not from wrong working</u> **full marks** should be awarded.

Do <u>not</u> award the marks if the answer was obtained from an incorrect method, ie incorrect working is seen <u>and</u> the correct answer clearly follows from it.

3. Where follow through (**FT**) is indicated in the mark scheme, marks can be awarded where the candidate's work follows correctly from a previous answer whether or not it was correct.

Figures or expressions that are being followed through are sometimes encompassed by single quotation marks after the word *their* for clarity, eg FT 180 × (*their* '37' + 16), or FT 300 – √(*their* '5^2 + 7^{2}'). Answers to part questions which are being followed through are indicated by eg FT 3 × *their* (a).

For questions with FT available you must ensure that you refer back to the relevant previous answer. You may find it easier to mark these questions candidate by candidate rather than question by question.

4. Where dependent (**dep**) marks are indicated in the mark scheme, you must check that the candidate has met all the criteria specified for the mark to be awarded.

5. The following abbreviations are commonly found in GCSE Mathematics mark schemes.

   - **cao** means **correct answer only**.
   - **figs 237**, for example, means any answer with only these digits. You should ignore leading or trailing zeros and any decimal point eg
   - 237000, 2.37, 2.370, 0.00237 would be acceptable but 23070 or 2374 would not.
   - **isw** means **ignore subsequent working** (after correct answer obtained).
   - **nfww** means **not from wrong working**.
   - **oe** means **or equivalent**.
   - **rot** means **rounded or truncated**.
   - **seen** means that you should award the mark if that number/expression is seen anywhere in the answer space, including the answer line, even if it is not in the method leading to the final answer.
   - **soi** means **seen or implied**.

6. Make no deductions for wrong work after an acceptable answer unless the mark scheme says otherwise, indicated for example by the instruction 'mark final answer'.

7. As a general principle, if two or more methods are offered, mark only the method that leads to the answer on the answer line. If two (or more) answers are offered, mark the poorer (poorest).

8. When the data of a question is consistently misread in such a way as not to alter the nature or difficulty of the question, please follow the candidate's work and allow follow through for **A** and **B** marks. Deduct 1 mark from any **A** or **B** marks earned and record this by using the MR annotation. **M** marks are not deducted for misreads.

9. Unless the question asks for an answer to a specific degree of accuracy, always mark at the greatest number of significant figures even if this is rounded or truncated on the answer line. For example, an answer in the mark scheme is 15.75, which is seen in the working. The candidate then rounds or truncates this to 15.8, 15 or 16 on the answer line. Allow full marks for the 15.75.

10. If the correct answer is seen in the body and the answer given in the answer space is a clear transcription error allow full marks unless the mark scheme says 'mark final answer' or 'cao'. Place the annotation ✓ next to the correct answer.

If the answer space is blank but the correct answer is seen in the body allow full marks. Place the annotation ✓ next to the correct answer.
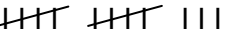
If the correct answer is seen in the working but a completely different answer is seen in the answer space, then accuracy marks for the answer are lost. Method marks would still be awarded. Use the M0, M1, M2 annotations as appropriate and place the annotation ✗ next to the wrong answer.

11. Ranges of answers given in the mark scheme are always inclusive.

12. For methods not provided for in the mark scheme give as far as possible equivalent marks for equivalent work. If in doubt, consult your Team Leader.

13. Anything in the mark scheme which is in square brackets […] is not required for the mark to be earned, but if present it must be correct.

MARK SCHEME

Question			Answer	Marks	Part marks and guidance	
1	a		[Rowan Frequency] 6 [Other Tally] ⊞⊞ ⊞⊞ III	2	**B1** for each	
	b		All heights correct and all bars correctly placed	2FT	**FT** *their* Rowan frequency **B1** for two correct heights or all heights correct with unequal widths	Correct heights are 15, 18, 6, 13 Tolerance on Oak and Rowan ±1mm by eye Tolerance for Beech and Other closer to middle of rectangle than the top or bottom Allow good freehand if within tolerance
	c		30	2	**M1** for 18/60 **oe**	
2	a	i	7 ¼ oe	1		Accept eg $\frac{58}{8}$ ISW Do not accept eg $6\frac{5}{4}$
		ii	36	2	**M1** for 63 ÷ 7 **soi**	Implied by [$\frac{1}{7}$ of 63] = 9 $\frac{63}{7}$ not enough for M1 without 9 or division sign or bus stop eg $7\overline{)63}$
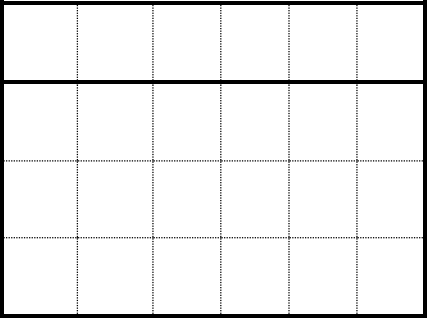
Question			Answer	Marks	Part marks and guidance	
	b		$[\frac{4}{5}=]\frac{36}{45}$ **and** $[\frac{7}{9}=]\frac{35}{45}$ **oe** or $[\frac{4}{5}=]$ 0.8 **and** $[\frac{7}{9}=]$ 0.77… or 0.78	2	**M1** for correct equivalent fraction or decimal to $\frac{4}{5}$ or $\frac{7}{9}$ **ISW** **Or M1** for finding $\frac{4}{5}$ and $\frac{7}{9}$ of a common multiple of 5 and 9	Accept any valid complete comparison Condone equivalent percentage. Accept $0.\dot{7}$
	c		Any **fraction** n st $0.2 < n < 0.25$ such as $\frac{9}{40}$	2	**M1** for either a fraction equivalent to 0.2 **and** a fraction equivalent to 0.25 **seen**, where the denominators o**r** the numerators are the same e.g. $\frac{8}{40}$ **and** $\frac{10}{40}$ **seen** or $[\frac{1}{5}=]$ 0.2 **and** $[\frac{1}{4}=]$ 0.25 **seen** or n st $0.2 < n < 0.25$ where n not a fraction	Accept equivalent percentages Eg $\frac{4.5}{20}$
3	a		When multiplying [12.4] by 10, Nathan has not moved the figures to the left [he has just added a 0]	1	Accept 12.4 × 10 = 124 not 12.40	Condone he has not moved the decimal point to the right soi Accept reference to either first or second line of working **See Appendix B**
			285.2	2	**M1** for 12.4 × 20 = 248 or 124 x 2 = 248	Accept 248 seen If 12.4 × 23 is worked out using grid method, allow M1 if no more than one error. If other long multiplication method used, allow M1 if not more than one arithmetic slip but M0 if error in place value

Question			Answer	Marks	Part marks and guidance	
	b		8.60	3	**M2** for 6.45 × 4 ÷ 3 **oe** Or **M1** for 6.45 × 4 **oe** or 25.8[0] **seen**	
4	a	i	3.2	2	Accept 3.1 to 3.3 **M1** for 6.2 to 6.6[cm] **seen** or 62 to 66[mm] **seen**	May be seen on diagram or on the answer line
		ii	115	1	Accept 113 to 117	
	b		C marked 5 cm from B C marked on bearing of 230° from B	2	Accept 4.8 to 5.2 cm Accept 226° to 234° **B1** for one correct	Condone C not labelled if clear indication is given eg marked with a cross If C not indicated, an arc radius 5cm, centre B scores B1 with no other arcs Use overlay as a guide for 2 marks or use on screen ruler and protractor to confirm B1. Protractor reading 126° to 134°
5	a		$3x^2 + 6xy$ final answer	2	**B1** for $3x^2$ or $6xy$ **seen**	Condone $6yx$ Do not accept eg $6 \times x \times y$
	b	i	4	1		
		ii	33	2	**M1** for $\dfrac{x}{3} = 9 + 2$ or better **or** **M1** for $x = a \times b$ following $\dfrac{x}{b} = a$	Alternative method **M1** for $x - 6 = 27$ **or** **M1** for $x = a + b$ following $x - a = b$
6	a		Corresponding	1		Do not accept F angles

Question			Answer	Marks	Part marks and guidance	
	b		Angle BXC = 50	2	**B1** for Angle XCB = 65	XCB may be seen on the diagram Accept C for XCB, X for BXC Condone isos for isosceles
			[Angles in a] isosceles [triangle]	1		
			Angles in a triangle add up to 180	1	Accept Alternate angles [are equal] **and** Angles on a [straight] line =180	[Angles in a] isosceles triangle add up to 180 scores final 2 marks Key words for 1 mark in 'Angles in a triangle add up to 180' are 'triangle' and '180'
7			**For candidates who have not added the erratum** **"The coin is put back" to their script you must use mark scheme in APPENDIX A** [1p] 6 [2p] 8 [5p] 5 and [10p] 1	 1 1 2	**M1** for 5p and 10p coins total value being 35p **soi** or 57 – *their 6* x 1 – *their 8* x 2 Or Following 0 marks **SC1** for a total of 20 coins or a total of 57p	 eg M1 implied by [5p] 1 and [10p] 3 from values given in the answer spaces
8	**a**	**i**	11	1		Accept -11, ±11
		ii	$\dfrac{1}{16}$	1		Accept 0.0625

Question			Answer	Marks	Part marks and guidance	
	b		9	2	**M1** for $(9-6)^2$ or better **Or** **SC1** for answer of 144	
	c		5^3 = 125	1		
9	a		12	3	**M2** for 420 ÷ 7 ÷ 5 or 420 ÷ 35 Or **M1** for 420 ÷ 7 **soi** or 420 ÷ 5 **soi**	Condone 12.0, 12.00
	b	i	20% is one day **oe**	1	Or 20% = 1/5	**See Appendix B**
		ii	336	2	**M1** for 420 × 0.8 **oe** or 420 – 84 or *their 12* x 7 x 4 **oe**	
10	a	i	4 – *n* final answer	1		Accept eg 4 – *x* Ignore *C* = or *w* = etc Ignore any units given in all parts
		ii	2*n* final answer	1		Accept *n*2, 2 x *n*, *n* x 2 Condone 4(4 – *n*) Ignore *A* = etc

Question			Answer	Marks	Part marks and guidance	
	b		$\frac{16}{6}$ or $\frac{8}{3}$ or $2\frac{4}{6}$ or $2\frac{2}{3}$ or 2.6[6…] or 2.7	3	**M1** for $4(4-n)$ **oe** or $4 \times 4 \div 3$ or better And **M1** for *their* $4(4-n) = 2n$ or better or $2n = \dfrac{16}{3}$ **oe** or $4(4-n) = \dfrac{16}{3}$ **oe**	lsw Accept eg $5\frac{1}{3}$ or 5.33[…] for $\dfrac{16}{3}$ M1M1 implied by eg 5.33 ÷ 2
11	a		18, 29	1		Ignore subsequent terms
	b		7	2	**M1** for the term before 31 is 19 **soi**	Condone 7, 12, 19,... for 2 marks. M0 if a 19 is **just** seen as the difference
	c		First term is $y - x$ Fourth term is $x + y$ Fifth term is $y + x + y$ or $2y + x$ oe	1 1 1FT	 **FT** *their Fourth term* + y	Condone their correct expressions equated to different variables eg $2y + x = n$ etc *Their Fourth term* an expression in x and/or y
12	a		Valid reason	1	Such as 'to make it easier to work out the area'	**See Appendix B**

Question			Answer	Marks	Part marks and guidance	
	b		19 000 or 19 200	5		Mark answer line first, award 5 for a correct answer. If incorrect, then award M marks for correct steps **seen**
					M2 for 150 × (180 + 220) ÷2 **soi** **Or** **M1** attempt at an area	Area of trapezium 30000 Such as 180 x 150 or 220 x 150
					And **M1** attempt to convert *their area* to hectares **soi**	Eg *their* area ÷ 10000 oe
					And **M1** for 6400 × *their area*	*Their area* in m^2 or hectares eg 180 x 150 x 6400 or 6400 x 30000 or eg 6400 x 3 For the final 2 marks their area may have come from an attempt at perimeter, volume, etc
13	**a**			2	**B1** for rectangle 6cm by 4cm	Accept clear intention Accept any orientation Use overlay For B1 ignore any **internal** lines within a rectangle 6cm by 4cm

Question			Answer	Marks	Part marks and guidance	
	b		54	3	**B1** for 9 [cm^2] **And** **M1** for *their* 9 × 6 or for a volume calculation where 6 is identified as the length	seen as area Eg *b* x *l* x *w* = 4 x 6 x 3 May be seen on diagram
14			$\frac{1}{11}$ final answer	2	**M1** for $\frac{30}{330}$ oe or correct cancelling shown After 0 scored, **SC1** for their fraction written in simplest form	For M1, condone 1 correct stage of cancelling common factors in numerators and denominators SC1 dep on a fraction that reduces
15			64	3	**M2** for 160 ÷ 2.5 **oe isw** Or **M1** for 160 and 2.5 **oe seen** or for attempt at 160 divided by *their* time interval **isw** Or for clear attempt to find gradient of line joining (09 00, 0) to (11 30, 160) or *their* dist divided by 2.5 **oe isw**	For M1, *their* time interval is in range 2 to 3 or 2h 30m or 1.5 or 3.5, accept 150 mins used

13

Question	Answer	Marks	Part marks and guidance	
16	A - Yes with appropriate reasoning involving rounding and correct simplification to 3 : 8 or 3 :11 or 8 : 11 or ratios reversed OR B - Yes it is approximately correct oe and simplification of 6400 : 16200 to 32 : 81 OR C - Yes with a correctly evaluated calculation using e.g. ratio 3 : 8 with a comparison comment OR D - Yes and e.g. 16200 ÷ 8 **and** 6400 ÷ 3 correctly evaluated	3	**M2** eg for showing 6000 : 16000 and reducing to 3 : 8 or for appropriate rounding at some stage in correctly simplifying ratio leading to 3 : 8 **isw** or reduces 6400 : 16200 to 32 : 81 **isw** or reduces 6400 : 22600 to 32 : 113 **isw** or for ratio calculation leading to one of the following values seen 6075, 6163 to 6165, 16436 to16440, 17066 to 17067 or 22 275 or 23 463 to 23 467 seen **isw** or for 2025 **and** 2133 to 2134 seen **isw** or 2025 **and** 2054 to 2055 seen **isw** or 2133 to 2134 **and** 2054 to 2055 **seen isw** Or **M1** for 6000 or 16 000 or 20 000 or 22 000 or 23 000 **seen** or for appropriate rounding of one number at some stage in simplifying ratio or for intention to find $\frac{3}{8}$ of 16 200 or for $\frac{8}{3}$ of 6400 or $\frac{3}{11}$ of (16 200 + 6400) or $\frac{8}{11}$ of (16 200 + 6400) **isw** or for 6400 ÷ 3 **and** one of 16 200 ÷ 8 or (6400 + 16 200) ÷ 11 seen **isw** or 16 200 ÷ 8 **and** (6400 + 16 200)÷ 11 seen **isw**	For all marks accept method with equivalent fractions or decimals [3sf or better] Allow equivalent methods working with the totals e.g. 3 : 11, condone 22600 rounded to 22000 For 3 or M2, allow clear 'reverse' methods working from e.g. 3 : 8 to 6000 and 16000 Accept clear working if not in ratio form e.g. 3.2 and 8.1 shown not in ratio The figures in the part marks column are guidance on accuracy required for 3 marks or M2 **SEE APPENDIX B**

Question			Answer	Marks	Part marks and guidance	
17	(a)		$\dfrac{y+3}{7}$ or $\dfrac{-y-3}{-7}$ final answer	2	**M1** for $y + 3 = 7x$ or $\dfrac{y}{7} = x - \dfrac{3}{7}$ Or for correct FT completion to answer after incorrect first step has been shown	For M1, accept the 'negative terms' versions
	(b)	(i)	$x\,(x - y)$ final answer	1		Condone omission of final bracket Condone [1]x([1]x − [1]y)
		(ii)	$(x + 6)(x + 2)$ final answer	2	**M1** for $(x + a)(x + b)$ where $ab = \pm12$ or $a + b = \pm8$ or for $x(x + 6) + 2(x + 6)$ seen or $x(x + 2) + 6(x + 2)$ seen	a, b integers For 2 marks, condone solutions after correct factors For 2 marks or M1, condone omission of final bracket
18			69, 76, 76, 79	4	In any order **B3** for 4 values with a mode of 76 and a range of 10 OR **B1** for the sum of the 4 values is 300 soi **B1** for at least 2 values with a mode of 76 **B1** for a range of 10 for their given values	Mark final answer in working if answer line blank Integers only for all B marks Condone if 300 shown in working and then *their* final values do not sum to 300 May be from 2, 3 or 4 values on answer line May be from 2, 3 or 4 values on answer line
19	(a)		22 : 15	2	**M1** for any equivalent ratio or for two correct ratios with a common number of children seen implied by 22k and 15k seen ($k > 1$ and an integer) Or for $\dfrac{11}{3} : \dfrac{5}{2}$ or for 11 : 7.5	15k : 22k implies M1 Accept 3.66 to 3.67 : 2.5

Question			Answer	Marks	Part marks and guidance	
	(b)		258	3	**M2** for $\frac{36}{2} \times 5 + \frac{36}{3} \times 11$ [+36] **oe** or $((2 \times 11) + (3 \times 5)) \times 36 \div 6$ [+36] **oe** or $\frac{6}{6+15+22} \times x = 36$ **oe** or **M1** for $\frac{36}{2} \times 5$ or $\frac{36}{2} \times 7$ **soi** or $\frac{36}{3} \times 11$ or $\frac{36}{3} \times 14$ **soi oe**	M2 implied by 222 [+36] not spoiled 90 + 132 [+ 36] Implied by 90 or 126 or 132 or 168 seen
20			160 and assumed that sample of 50 is representative oe	3	**B2** for 160 or **M1** for $\frac{8}{50} \times 1000$ **oe** **AND** **B1** for assumed that sample of 50 is representative **oe**	 Accept: Representative, not biased, random Ignore extra comments after correct comment given **SEE APPENDIX B**
21	(a)		$13^2 - 12^2$ or 169 - 144 $\sqrt{13^2 - 12^2}$ **soi** Two shortest sides in both triangles are 5 [cm] and 12 [cm]	M1 M1 dep A1	Or $5^2 + 12^2$ or 25 + 144 or $\sqrt{5^2 + 12^2}$ **soi** or 5[cm] side clearly labelled on triangle P **and** 13[cm] clearly labelled on triangle Q	$5^2 + 12^2$ seen with $13^2 + 12^2$ scores M0 May be seen in stages eg 5 x 5 =25 12 x 12 = 144 25 + 144 = For second M1 must see √ symbol $\sqrt{13^2 + 12^2}$ scores M0

Question			Answer	Marks	Part marks and guidance	
	(b)		[All] the sides are the same length	**1**	Accept SAS **or** RHS **or** SSS **soi**	**See Appendix B**

APPENDIX A

Qu7 Erratum

Markscheme **for candidates who have not written "The coin is put back".**

Mark according to standard ms

Or
(note that the coin is not put back and that coin could be any of 1p, 2p, 5p or 10p – if the candidate does not state which coin has been taken or they assume 20 coins remain, mark to candidates advantage.)

[If 1p taken]
B1 for 1p coins = 5
B1 for 2p coins = 8
M1 for 36p remaining or 57 – *their 5* x 1 – *their 8* x 2
B1 for impossible

[If 2p taken]
B1 for 1p coins = 6
B1 for 2p coins = 7
M1 for 37p remaining or 57 – *their 6* x 1 – *their 7* x 2
B1 for impossible

[If 5p or 10p taken]
B1 for 1p coins = 6
B1 for 2p coins = 8
B2 5p coins = 3 and 10p coins = 2
Or M1 for 5p and 10p coins total value
being 35p **soi**
or 57 – *their 6* x 1 – *their 8* x 2

Following 0 marks
SC1 for a total of 19 coins or a total of 57p from values given in the answer spaces

Exemplar responses for Q3(a) explanation mark

	Response	Mark
1	For 10 × 12.4 Nathan has only times by 1. For 20 × 12.4 he has only times by 2. 10 × 12.4 = 124. *Accept identifying that he has timesed by 1 instead of 10, or by 2 instead of 20.*	**1**
2	10 × 12.4 is not 12.40 it is 124. He didn't add the 0s onto the numbers. *10 x 124 is not 12.40 it is 124 scores 1, ignore the rest of the explanation because it is unclear rather than being incorrect.*	1
3	He added 0 to 12.4 *Explains what he has done wrong.*	1
4	He does not move the decimal place when he x by 10 so it should have been 124.0. *Doesn't need to say where*	1
5	Nathan has got the place value wrong on first answer. *They have correctly identified that the error is in the place value*	1
6	10 × 12.4 = 124 so 20 × 12.4 is wrong *Allow identification of error in second line*	1
7	Instead of moving the decimal place to the right he just added a zero to the end of the number and instead of multiplying he add. *Ignore final part of statement*	1
8	He hasn't multiplied it he just added a zero that makes no difference. *Error identified and 'makes no difference' explains error*	1
9	He said that 20 × 12.4 is 24.80 when it is 248 which means the answer is 285.2 *Accept reference to second line of working*	1
10	When Nathan done 10 × 12.4 it should equal 124 *10 x 12.4 = 124 is not enough. 'It should equal 124' is just about enough to identify the error.*	1bod
11	When he multiplied by 10 he didn't remove the decimal place and same when he multiplied by 20 *Multiplying by 10 isn't the same as removing the decimal place.*	0
12	Nathan kept the decimal in. When calculating a sum with a decimal you take it out as you do the sum then put it back at the end. *Too vague.*	0
13	Nathan has divided the 12.4 rather than moving the decimal point to the right (positive/multiplying) *Moving the decimal point to the right would score 1, but we can't ignore the rest of the explanation because it is incorrect rather than unclear.*	0
14	12.40 is wrong *Identifies error but doesn't explain*	0

Exemplar responses for Q9(b)i

	Response	Mark
1	20% is 1/5 and she is getting rid of 1/5 of her days so 20% is reasonable	1
2	Because each day is 20% of that week so to take off 20% is fine.	1
3	5 days = 100%, 5 days – 1 day = 80%, 1 day = 20%	1
4	20% = 84 £420 – 84 = £336. 20% of 420 is equal to 1 day of pay.	1
5	Because 5 days add up to 100% and each day is worth 20% which is reasonable.	1
6	20% is how much she would get each day usually.	1
7	20% is equal to 1 days pay	1
8	Because 20% of her original pay is how much she earns in one day so she doesn't lose any more than	1
9	Because each day represents 20% of her weekly pay	1
10	20% of 5 is 1. She loses 1 day pay!	1
11	20% x 5 = 100% 20% x 4 = 80 *If one day isn't mentioned, reference to 5days & 4 days could imply 1 day*	1
12	Because she is working a day less so 5 days = 100%, 4 days = 80%.	1
13	Because she is working for 1 less day *20% is stated in the question*	1
14	20% is a reasonable reduction as 7 hours = 20% of Lillian's earnings. *7 hours is equivalent to one day*	1
15	Because it works out as a day less pay. *20% is stated in the question*	1
16		
17	She is not working 5 days a week therefore 2/10 has been taken away *2/10 doesn't link to one day even though it is equivalent to 1/5*	0
18	She is working less hours	0
19	Its only a 1/5 of her earnings *Not linked to day*	0
20	Because she was going to work 4 days a week while before she was working for 5 days a week *80% not linked to 4 days*	0
21	A 20% reduction is reasonable, she only wants to work 4 days a week, she will only be earning 80% of what she used to earn. *Doesn't link 4 days to 5 days*	0
22	She is working for 20% less time	0
23	She would only be losing out on 84 pounds	0
24	Because 20% is one whole and she is working one less day. *'One whole day' would have scored*	0

Exemplar responses for Q12(a)

Acceptable answers are likely to include reference to easier, approximate or estimate

	Response	Mark
1	Rounding it to 1 significant figure could be too inaccurate.	1
2	To make it easier to find the area	1
3	He will be able to work out easier the area of his field with a bit of extra space.	1
4	So that the area of his field is a whole number. *Implies easier to calculate because of 'area'*	1
5	So the farmer can get an estimate	1
6	Easier and more efficient than having measurements with lots of decimal places	1
7	As it gives an easier length to have whole numbers rather than a decimal *'Easier' is the key word to score*	1
8	It can give him an approximate idea on the field quicker and easier	1
9	It is easier to calculate	1
10	It makes it easier for him	1
11	So he does not get decimal answers	0
12	To make it a whole number.	0
13	So he can get a rounded number with no decimals.	0
14	So that he gets a whole number instead of a decimal. *This could apply to 1sf*	0
15	because it is difficult to work out the area of the whole field	0
16	To give a accurate measurement	0
17	He will have just over what he needs for the field	0
18	to give him a more accurate and easier figure to use *Contradictory*	0
19	The exact area is quite difficult to measure *'calculate' instead of 'measure' would score*	0
20	The measurement of the field was probably not accurate	0
21	So the measurements would be more accurate	0
22	To get a rough measurement of the field *'calculation' instead of 'measurement' would score*	0

Exemplar responses for Q16

	Response	Mark
1	6400 : 16200 = 64 : 162 = 32 : 81 which is roughly 30 : 80 = 3 : 8 so yes	**3B**
2	6000 + 16000 = 22000, 22000 ÷ (3 + 8) = 2000 *Method C but better* 3 × 2000 = 6000 , 8 × 2000 = 16 000 so yes she is correct	**3C**
3	3.2 and 8.1 in working. Close as he can round the decimals to nearest whole number. *Decision not clear*	**M2B**
4	3 : 8 = 6 : 16 = 6000 : 16000 yes Katie is correct if she rounds to the nearest 1000 *Reverse method*	**3A**
5	16 200 ÷ 8 = 2040, 2040 × 3 = 6120 she is not correct *Error made in calculation M2 not available*	**M1C**
6	16 200 ÷ 8 = 2025, 2025 × 3 = 6075 which is close to 6400 so yes she is approximately correct	**3C**
7	16200 + 6400 = 22600, 22600 ÷ 11 =2540, 2540 × 3 *Intention to find 3/11 with errors*	**M1C**
8	16200 + 6400 = 22600 = 22000, 22000 ÷ 11 = 2000 *M1 for one correct rounding*	**M1D**
9	16200 ÷ 8 × 3 = 6075 No it is not correct *Correctly evaluated calculation with ratio 3 : 8*	**M2C**
10	16200 : 6400 = 81 : 32 = 8.1 : 3.2 which is approximately 8 : 3 so she is correct	**3B**
11	6000 ÷ 3 = 2000 and 16000 ÷ 8 = 2000 so yes *Equivalent to 4th the method but better*	**3D**
12	16000÷8 = 2000, 6400÷3 = 2138.3×11 = 23466. Approximately 400 off so No. *Error in calculation*	**M1C/D**
13	16200 × 3/8 =6075. No not correct as for ratio to be correct her loan would have to be £6075.	**M2C**
14	6400÷3 = 2133.33, 16200÷8 = 2025. Not correct as ratio parts are not equal.	**M2D**
15	16200 – 6400 = 9800, 9800 ÷ 5 x 3 = 5880 No	**M2C**

Exemplar responses for Q20

Answer should refer to sample and imply the sample asked was random/representative
Accept answers that refer to the proportions for 1000 being the same as the sample oe

		Response	Mark
1		Assume he asked males and females *Implies sample should be representative*	1
2		He did not just ask one age group *Implies sample should be representative*	1
3		His sample is random	1
4		The sample is reliable for other customers	1
5		He used stratified sampling meaning it was in proportion	1
6		It stays in the same proportion	1
7		Assuming the other people say the same	1
8		Everyone has the same style as the people in the survey	1
9		I assume that the trend in his table would carry on for the next 1000 shoes.	1
10		I made the assumption that his other customers buy the same as the customers he sampled	1
11		50 customers represent the same as what 1000 customers want	1
12		For every 50 customers the variation is constant	BOD1
13		I assumed the number of people choosing sandals would remain the same	BOD1
14		He asked his consistent regular reliable customers	BOD 1
15		He only asked people visiting the shoe shop to answer his survey *This does not address the sample issue – they are all his customers*	0
16		Because for every customer's choice 20 pairs should be bought.	0
17		He only sampled 50 people so the results might not be accurate.	0
18		The same customers came in	0

Exemplar responses for Q21(b)

	Response	Mark
1	Their sides are the same lengths	1
2	They both have the same side lengths and are right angled	1
3	EXACTLY the same – angles and sides	1
4	They both has a right angles with the adjacent side being 12cm and their hypotenuse be 13cm	1
5	The measurements of their sides have **not changed** only the position of the shape has *same implied*	1
6	Because they're both a right angle triangles with the same length lines	1
7	Same lengths on each line	1
8	Same lengths and angles	1
9	Because they are both right angle triangles with the same lengths	1
10	Because they both have the same sides	1
11	The two triangles are congruent as they have same sides and shape	1
12	RHS *sometimes this is implied from a worded sentence*	1
13	They have the same measurements exactly *measurements could refer to angles*	0
14	Because they are the same size and do not change shape. *Sides not referred to*	0
15	As they both have the same numbers and a right angle	0
16	Two sides have the same length	0
17	Because they both have the same length short side and are both right angled triangles *'Short sides' would imply SAS and so score 1*	0
18	Because they have 2 sides and an angle that are the same *'and angle inbetween' would score 1*	0
19	They are the same but just at a different position	0
20	ASA	0

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