OCR
RECOGNISING ACHIEVEMENT

GCSE

Mathematics A

General Certificate of Secondary

Unit **A502/01:** Mathematics B (Foundation Tier)

Mark Scheme for January 2011

Confidential marking instructions for examiners (January 2011)
A502/01 GCSE Mathematics A (J562)

Marking instructions

1   Mark strictly to the mark scheme.

2   Make no deductions for wrong work after an acceptable answer unless the mark scheme says otherwise.

3   Work crossed out but not replaced should be marked.

4   **M** (method) marks are not lost for purely numerical errors.
     A (accuracy) marks depend on preceding **M** (method) marks. Therefore **M0 A1** cannot be awarded.
     B marks are independent of **M** (method) marks and are awarded for a correct final answer or a correct intermediate stage.

5   Two additional situations may appear in the mark scheme allowing the award of **A** marks or independent (**B**) marks:
     i.   Correct answer with no working
     ii.   Follows correctly from a previous answer whether correct or not ("ft" on mark scheme and on the annotations tool).

6   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).

7   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.

8   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.

9.   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. If the answer is missing, but the correct answer is seen in the body allow full marks. If the correct answer is seen in 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.

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

11   For methods not provided for in the mark scheme give as far as possible equivalent marks for equivalent work.

12   For answers scoring no marks, you must either award NR (no response) or 0, as follows:

      Award NR (no response) if:
      •   Nothing is written at all in the answer space
      •   There is any comment which does not in any way relate to the question being asked ("can't do", "don't know", etc.)
      •   There is any sort of mark that is not an attempt at the question (a dash, a question mark, etc.)

      Award 0 if:
      •   There is any attempt that earns no credit. This could, for example, include the candidate copying all or some of the question, or any
              working that does not earn any marks, whether crossed out or not.

13   Where a follow through mark is indicated on the mark scheme for a particular part question, you must ensure that you refer back to the
      answer of the previous part question.

14   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.

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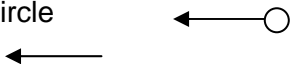
The following abbreviations are commonly found in GCSE Mathematics mark schemes.

•   Where you see **oe** in the mark scheme it means **or equivalent.**

•   Where you see **isw** in the mark scheme it means **ignore subsequent working** (after correct answer obtained), provided the method has
        been completed**.**

•   Where you see **cao** in the mark scheme it means **correct answer only.**

•   Where you see **soi** in the mark scheme it means **seen or implied.**

•   Where you see **www** in the mark scheme it means **without wrong working.**

•   Where you see **rot** in the mark scheme it means **rounded or truncated.**

•   Where you see **seen** in the mark scheme it 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.

•   Where you see **figs 237**, for example, this means any answer with only these digits. You should ignore leading or trailing zeros and any
        decimal point e.g. 237000, 2·37, 2·370, 0·00237 would be acceptable but 23070 or 2374 would not.

1	**(a)**	(i) 400	**1**		
		(ii) A 80	**1** **1**	If **0** scored, **B1** for 320 seen	
		(iii) 900 or *their* 400 + 500	**2FT**	**B1** for 500(ml) soi	Eg 300, following 800 in (a)(i) where subtraction has occurred
	(b)	1999, 2039, 3194, 3419, 4193	**1**	look for 19 - -, 20 - -, 31 - -, 34 - -, 41 - -	
2	**(a)**	(i) 50	**1**		
		(ii) Halve 6.3 or 2.6 × (0).25 oe	**1**	Accept "halve 12.6 and halve again" oe or any complete method i.e. ÷100 × 25, find a quarter of 12.6, etc or 3.15 as answer	Not method that relies on finding 10% etc unless division by 10 oe mentioned.
	(b)	$\dfrac{3}{4}$	**2**	**B1** for partial cancellation eg $\dfrac{9}{12}$ or $\dfrac{6}{8}$ isw	
3	**(a)**	99	**1**		
	(b)	21	**1**	Condone 20, or 10 + 11 or 10 + 10 seen	
	(c)	Any pair of two digit numbers that sum to 100	**1**	**B0** for 50 + 50	

(d)	Evidence (structured list) or argument well set out **And either** There can only be 45 pairs at most, so he is wrong **or** There are 40 pairs and so he is wrong oe	**3**			For each card only one other card will sum to 100. There are only 90 cards. At most there can be 45 pairs so he is wrong. Or 90 + 10 is one pair 89 + 11 is next down to 51 + 49 90 to 51 giving 40 pairs.
	Evidence or argument that there are 40 pairs or at most 45 pairs but which has no conclusion or slight error **or** Well presented evidence or argument but includes repeats and so concludes more than 50 (80 pairs) **or** "No" and **Describes** pairing from 10 to 90 eg describes 10+90, 11+89 up to 49+51 **or** "No" recognises 10 as start and states 40 pairs.	**2-1**	List of at least 3 pairs adding to 100 (may include repeated numbers eg 50+50) **but** no triples etc. **or** **(Yes)** and **Describes** pairing from 1 to 99, eg describes 1+99, 2+98 etc **or** **(No)** and there are no numbers below 10 oe. **or** Recognises there is only one 50 card.		
	Insufficient relevant working **or** List of pairs adding to 100 with inclusion of triples, quadruples etc. **or** statement that he is wrong with **no** supporting evidence	**0**			

4	**(a)**	Chord Tangent Centre	**1** **1** **1**		
	(b)	Correct ruled hexagon ±2mm	**3**	**B2** for (freehand) hexagon with all sides 5cm ± 5mm and vertices within 2mm of circle, all by eye **or** **B1** for any hexagon with vertices on circle ±2mm or 360 ÷ 6 or 60 seen or radius stepped around circle	Scoris 1 : 1 and mark by eye Use ruler to check **obvious** discrepancies
5		True False False	**2**	**B1** for two correct responses	Accept ✓ for True and × for False. (F F F or T T F or T F T)
6	**(a)**	70	**1**		
	(b)	(0).6	**2**	**M1** for 3 ÷ 5 attempted Condone extra 0s after 6 (0.600)	
	(c)	$\left(\dfrac{3}{5}\right)$ > (56%)	**1FT**	Ft *their* part **(b)** Condone use of ≥	

7	(a)	69 to 76.1 www	2	**B1** for (20 or 19) and 3
				        or 60
				        or 57 (NOT 57.12)	

	(b)	Completely correct solution, with correct use of money notation, rounded numbers and calculations. Working well set out and easy to follow. Answer in range £280 to £350 and "She is wrong" or "She will earn less" oe	3		Daily £7 × 8 or 9 or 10 = £56 or 63 or 70 £7.2 x 8 = 57.60 £7.2 × 9 = £64.80 Weekly £56 x 5 = £280
		Correct full method (May not be fully evaluated or contain errors) Few notations or annotations. Numbers may be inappropriately or not rounded Eg 8¾ x 7.19 x 5. and conclusion correct for their evidence.	2-1	One relevant calculation, without rounding, attempted. Meaning must be clear. Eg (Hours) 8¾ x 5 (= 40 ≤ answer ≤ 45) (Daily pay) 8¾ x 7.19 = ((£)56 ≤ answer ≤ (£)72) (Total pay) 8¾ x 7.19 x 5 = ((£)280 ≤ ans ≤ (£)360) or One relevant (may be rounded) calculation correct. or A conclusion, consistent with their weekly earnings, comparing their earnings figure with £400	£63 × 5 = £315 £70 × 5 = £350 £64.80 or £65 × 9 = £324 or £325 per week OR Daily £400 ÷ 5 = £80 £80 ÷ 9 = £8.8̇ or £9 per hour 8¾ x 7.19 x 5 = £314.5625 (calc)
		No relevant or correct working	0		7.19 x 5 = £35.95 8¾ x 5 = 43.75 8¾ x 7.19 = 62.9125 (calc)

8	(a)	$x \geq 0$	1	Condone use of >	
	(b)	(i) $x \leq 6$	2	Condone use of < for 2 marks **M1** for $7x \leq 47 - 5$ or better, **or** $7x = 47 - 5$ or better **or** 6 seen Ignore wrong simplification after correct first step.	$7x \leq 42$ or $x \leq 42 \div 7$ $7x = 42$ or $x = 42 \div 7$
		(ii) Numbers on number line to include *their* implied solution to (b)(i)	1FT	Dependent on b(i) being algebraic inequality. Must be consistent numbering on scale	If no answer to (b)(i) then must include 6 for mark
		Arrow pointing in direction consistent with their b(i) and starting at *their* 6	1FT	Dependent on b(i) being algebraic inequality. Condone empty circle ←—○ or no circle ←——	If no answer to (b)(i) then cao

9	(a)	Crosses showing negative gradient and close to straight line by eye	1	No line need be drawn Condone intended straight line with negative gradient.	Does not have to be 8 crosses but a minimum of 5 crosses discernible.
		Crosses randomly placed with no discernible pattern or in approximately straight vertical or horizontal line	1		
	(b)	(i) Straight line within overlay and at least between x = 1 and x = 15	1	Line ruled or straight by eye	
		(ii) *Their* 13 or 14	1FT	Strict follow through from (12, ….) from *their* line of best fit Must be integer	NB 12 but no line scores 0
		(iii) 8	1		
10	(a)	Correct plots and line between w = 50 and w = 260	3	**B2** for all 5 points correct **or** **B1** for any 2 points correct **and** **B1** for a straight line through at least 4 correct points	Two end points and line joining scores 3 marks If bar chart then mark points at consistent corners of the bars eg top right Accuracy: Centre of dot, cross or top of stick of bar within circle of overlay
	(b)	9.9 to 10.1 cm	1	FT *their* straight line if it intersects vertical axis	
	(c)	0.02 oe	1		
	(d)	No data for weights that big	1	Spring might snap, or Spring might reach full length oe	

11	(a)	Correct graph	2	**B1** for four points correct ($\pm$2mm by eye) **or** intended straight line**s** joining only *their* 6 points ($\pm$2mm by eye)	Condone minor gaps when lines "connect" Allow lines to imply points Lines must appear straight by eye
	(b)	8 or 9	1FT	If their graph is not correct then chosen week must be lowest point (or week + 1)	
		Graph begins to rise oe	1FT	If lowest week chosen then comment affirms this If week after lowest chosen the comment describes rising numbers	
	(c)	Point on $x = 14$	1	Or number of children in week 14 given in statement	
		Reason	1FT	FT *their* point Valid reason to support *their* placement of point	Must describe trend or Must explain deviation from trend.
12	(a)	124	1		
	(b)	71°	4	**Method 1** (corresponding angles) **B1** for DGC = 52 Indicated **B1** for DGF = 128 indicated	**Method 2** (quadrilateral) **B1** for ABC = 56 Indicated **M1** for 360 − 52 −(a) − *their* 56 all calculations clearly linked	Values must be linked to the correct angles on the diagram and not randomly spread about the working space.
				M1A1FT for $\dfrac{270 - their\,128}{2}$	$\dfrac{360 - 90 - their128}{2}$	

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