

Mark Schemes for Mathematics Level 1 2011

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All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the functional skills Report for centres.

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**OCR Level 1 Functional Skills Maths
Mark Scheme Referencing**

Our ref	Coverage and Range
N1	Understand and use whole numbers and understand negative numbers in practical contexts
N2	Add, subtract, multiply and divide whole numbers using a range of strategies
N3	Understand and use equivalences between common fractions, decimals and percentages
N4	Add and subtract decimals up to two decimal places
N5	Solve simple problems involving ratio, where one number is a multiple of the other
N6	Use simple formulae expressed in words for one-or-two-step operations
G1	Solve problems requiring calculation, with common measures, including money, time, length, weight, capacity and temperature
G2	Convert units of measure in the same system
G3	Work out areas and perimeters in practical situations
G4	Construct geometric diagrams, models and shapes
S1	Extract and interpret information from tables, diagrams, charts and graphs
S2	Collect and record discrete data and organise and represent information in different ways
S3	Find mean and range
S4	Use data to assess the likelihood of an outcome

Process Skills/Skill Standards

R = Representing

A = Analysing

I = Interpreting

Representing	Our Ref
Understand practical problems in familiar and unfamiliar contexts and situations, some of which are non-routine.	R1
Identify and obtain necessary information to tackle the problem	R2
Select mathematics in an organised way to find solutions	R3
Analysing	
Apply mathematics in an organised way to find solutions to straightforward practical problems for different purposes.	A1
Use appropriate checking procedures at each stage.	A2
Interpreting	
Interpret and communicate solutions to practical problems, drawing simple conclusions and giving explanations.	I1

FS Maths L1 March 2011 Marking Guidance

Task 1 – Get me to the church on time

Part	Process	Award	On evidence of	Notes	Skill Standards R A I
a(i)*	Locate average speed on M1 from table	1	1 60		R2
a(ii)*	Locate distance travelled on M42 from table	1	1 33		R2
a(iii)*	Find length of Route 2	3	3 147.5 or 148 seen 2 140.5 or 141 or <i>their A + 7</i> 1 Attempt $4+85+33+15+3.5$ [A]		R2 A1 A1
b*	Find time for journey	3	3 22.5 minutes or 23 minutes 2 22.5 or $15 / 40 \times 60$ attempted or 44 minutes 1 15 and 40 seen or $33 \div 45 \times 60$ or 44	Units essential Use convention for MIS-READ if wrong figures read from table.	R1 2A1
c	Comment on opinions about route 1	2	Comment involving any TWO of the following <ul style="list-style-type: none"> • Shorter (by 16.5 miles) / only 124 miles/less distance • Takes less time / faster /quicker • Higher speeds possible on M1/ 60 possible for more of journey/higher average speed on M1 • Fewer junctions (to slow you down on Route 1)/fewer changes 	Award for any TWO appropriate comments, only one per line here allowed. Do not reward “less roads” oe	2I1

Part	Process	Award	On evidence of	Notes	Skill Standards		
					R	A	I
d	Judge whether Peter is likely to arrive on time	8	<p>Motorway journey times (J)</p> <p>3 127 OR 127.8 OR 128 OR 2hrs 8 min</p> <p>2 22.8 OR 23 OR 105 mins OR 1hr 45 min</p> <p>1 19 AND 105 seen OR $19 \div 50 \times 60$ oe attempted</p> <p>Arrival time (T)</p> <p>12.53 OR 12.52 OR 10.20 + <i>their</i> (J + 25)</p> <p>3 OR compare T and 2 hr 40 min</p> <p>2 152.8 OR 152 OR 153 OR 2 hr 32.8min OR 2 hr 33min OR 10.20 + <i>their</i> (J) OR <i>their</i> J+25</p> <p>1 25min OR (10 + 15)min seen</p> <p>Conclusion</p> <p>2 10.20 is / is not a sensible time because it does/ does not leave time for travel hold-ups OR comfort break OR time to park at venue OR time to spare.</p> <p>1 10.20 is/is not sensible referring to <i>their</i> T but no acceptable explanation OR “arrives on time” OR “arrives late” oe</p>	<p>May be implied from correct T J may be truncated or rounded</p> <p>Condone use of numbers from Route 2 for attempt</p> <p>Depends on “<i>their</i>” T An arrival time between 12.00 and 12.45 is acceptable to justify 10.20 start. Condone 12.53</p> <p>0 if clearly silly journey time is recommended</p>	R1 R2 R2	A1	I1 I1 I1 I1
	<p>Checking</p> <p>Analyse</p>	2	<p>A clear check of a calculation or</p> <p>2 Statement that an answer is reasonable, or 3 correct calculations that would lead to an acceptable answer throughout the task or</p> <p>1 Fewer than 3 correct calculations and no checks</p> <p>0</p>			A2 A2	
Total		20		Total	7	7	6

Some evidence that may be seen in answering the task.

Part	On evidence of	Notes
a(i)	60	
a(ii)	33	
a(iii)	147.5 2+4+85+33+15+3.5+5 140.5	Beginning and final part of journey = 2+5 miles
b	numbers to go in the function machine 15 and 40 15/40 = 0.375 0.375 x 60 = 22.5 Answer of 22.5 minutes	If the candidate selects the incorrect figures from the table only the second and third marks are available to them.
c	1 mark = Aaliyah comments on 16.5 miles shorter distance using Route 1 1 mark = Higher speeds possible. 1 mark = fewer junctions.	
d	Travel time of Route 1 is 153 minutes (2h 33 m). Correct arrival time is 12.53 Potential factors include travel hold-ups; comfort break; time to park at venue Decision to be justified referring to their results.	Follow through candidate's travel time. One factor to be awarded marks. This is not sensible as it allows no time for any interruptions to the journey and assumes that parking will be very easy and convenient. A more appropriate time to leave would be between 9.30am and 10am

Task 2 – Green Fingers

Part	Process	Award	On evidence of	Notes	Skill Standards R A I
a(i)*	Work out area of allotment	2	2 40 (m ²) 1 10 x 4 www	Penalise missing or wrong units once only in a(i) and a(ii) If 40 m ² seen, ignore subsequent wrong working	R2 A1
a(ii)*	Work out a sub area	2	2 30 (m ²) or 7.5 x 4 attempted 1 10 – 2.5 or 7.5 or 10 m ² or 2.5 x 4 seen	m ² not required again	R3 I1
b(i)*	Calculate amount	2	2 4 or <i>their</i> area ÷ 10 and rounded up or 1 <i>their</i> area ÷ 10 attempted		A1 I1
b(ii)	Show price is £243	6	Perimeter [P] 2 42 (m) OR recognising length without gate = 40 1 Attempt to find <i>their</i> perimeter including <i>their</i> missing lengths Cost of fence [F] 2 £198 or £118.80 or <i>their</i> (P – 2) x £4.95 correct 1 £207.90 or £128.70 or <i>their</i> P x £4.95 correct Conclusion 2 F + £45 seen AND correct use of units 1 F + £45 seen	Award zero for 26 m but allow f/t Award perimeter marks if £207.9 or £198 seen here www. Condone use of £35 gate	R2 A1 I1 R3 A1 I1

Part	Process	Award	On evidence of	Notes	Skill Standards		
					R	A	I
b (iii)	Calculate and justify an answer using figures	6	<p>Borderline</p> <p>2 (£)194 or (£) 239 or (£)229 or <i>their</i> $P \div 10$ (rounded up) x 48.5 correct</p> <p>1 <i>Their</i> $P \div 10$ (rounded up) x 48.5 attempted</p> <p>Smart Fence</p> <p>2 (£)208 (<i>Must show as discounted not 4/5</i>) or (£)236 or (£)243 or (£)244 or (£)253</p> <p>1 (£)52 or (£)59 or (£) 61 or <i>their</i> 20% discount 260 - <i>their</i> discount or attempt 0.8×260</p> <p>Conclusion</p> <p>1 £239 is cheapest price OR</p> <p>Borderline is cheapest OR Correct answer based on <i>their</i> calculations</p> <p>AND</p> <p>1 Clear annotation and easy to follow for TWO fences which may include the calculation for Lander fencing in b(ii).</p>	<p>Condone use of £35 gate. Follow through from <i>their</i> P</p> <p>May take 20% off total price May include price of gate</p> <p>Need to include price of gate OK if £239 oe seen</p>	R1		I1
			R2	A1	I1		
	Checking	2	2 A clear check of a calculation or				
	Analyse		1 Statement that an answer is reasonable, or 3 correct calculations that would lead to an acceptable answer throughout the task or				
			0 Fewer than 3 correct calculations and no checks				
Total		20		Total	7	7	6

Some evidence that may be seen in answering the task.

Part	On evidence of	Notes
a(i)	40m^2	Must include m^2 for 2 nd mark
a(ii)	30	
b (i)	<i>their</i> area \div 10 and rounded up or 4 seen	
b (ii)	Missing lengths $4+7+5 = 16$ Calculate <i>their</i> perimeter $10+4+7+5+7+5+4 = 42\text{m}$ <i>Their</i> (perimeter $- 2$) $\times 4.95$ Add price of gate @ $\pounds 45$	Allow follow through from calculation of perimeter.
b (iii)	Requires a logical approach to justification of answer. Boarderline Fences $48.50 \times 4 = 194$ covert to $\pounds 194$ Add on price of gate + $\pounds 45 = \pounds 239$ Smart Fence Co $260 \times 20 / 100 = 52$ $260 - 52 = 208$ $208 + 45 = 253$ $\pounds 253$ Boarderline fences is cheapest	Allow follow through at all stages

Task 3 – Keep on running

Part	Process	Award	On evidence of	Notes	Skill Standards R A I
a(i)*	Find runner who was slowest	1	1 Sula		R1
a(ii)*	Give slowest time	1	1 2h 7min	No f/t from wrong name	R1
b(i)*	Find mean and four ranges to test statement	4	<p>Average.</p> <p>2 Yes AND [(45 + 38)] or $83 \div 2 = 41.5$ and 1 hour or Yes AND [(105 + 98)] or $203 \div 2 = 101.5 = 1\text{h } 41.5\text{min}$</p> <p>Or</p> <p>1 No AND [(45 + 38)] or $83 \div 2 = 41.5$ (and 1 hour) with 1 error or [(105 + 98)] or $203 \div 2 = 101.5 = 1\text{h } 41.5\text{min}$ with 1 error</p> <p>Range</p> <p>2 Jane's range is only 5 minutes OR 5, 7, (21) and 7 seen AND "She is not the lowest" oe</p> <p>Or</p> <p>1 Jane is lower but no evidence OR Three ranges but with 1 error and <i>correct</i> conclusion based on <i>their</i> ranges OR Three correct ranges and no conclusion</p>	<p>Condone misunderstanding of time here as evidence for mean and range eg (1.45+1.38)÷2=1.41.5</p> <p>Must show working and not just state 1h 41.5min oe Must change 101.5min to hours and minutes.</p>	R2 R3 A1 I1
b(ii)	Find likely winner	4	<p>By observation</p> <p>2 Emma is most likely to win because she has lowest/ fastest time OR</p> <p>1 Emma is most likely to win AND</p> <p>2 Emma was fastest each time she raced (against the others) OR</p> <p>1 Jane was fast and had smallest range OR Jane might win</p> <p>OR</p> <p>By calculation</p> <p>2 Emma is most likely to win because she has lowest mean 1 time OR</p> <p>2 Emma is most likely to win 1 AND Correct mean times for TWO others : Jane (1hr 48min), Ravi (1hr 56min), Sula (1hr 55min) OR ONE other mean time correct</p>	<p>Statements may come from "observation" AND "calculation" BUT maximum mark is 4 for b(ii)</p>	R2 A1 I1

Part	Process	Award	On evidence of	Notes	Skill Standards R A I
c	Application of a formula to compare data	8	<p>Method 1</p> <p>4 4 times correct</p> <ul style="list-style-type: none"> Jane 218-219mins or 3hrs38-39mins Ravinda 230-231mins or 3hrs50-51mins Sula 220-221mins or 3hrs40-41min Emma 204-205mins or 3hrs24-25mins <p>or</p> <p>3 3 of above times seen or Omits to add 9 minutes, but doubles fastest times to get 210, 222, 212, 196 oe</p> <p>or</p> <p>2 2 of 219, 231, 221, 205, oe seen or 2 of 210, 222, 212, 196 oe seen</p> <p>or</p> <p>1 2x105 or 2x111 or 2x106 or 2x 98 or 9 min or 8min (40 sec) or 524 seconds 0.145 hr or 240mins seen</p> <p>AND</p> <p>Method 2</p> <p>3 At least 3 times correct from</p> <ul style="list-style-type: none"> Jane 235mins or 3hrs55mins Ravinda 280mins or 4hrs40mins Sula 255mins or 4hrs15mins Emma 225mins or 3hrs45mins <p>or</p> <p>2 2 of above times correct</p> <p>or</p> <p>1 1 of above times correct or 5x47 or 5x56 or 5x51 or 5x45</p> <p>AND</p> <p>1 Statement that Jane and/or Emma have the best chance (as both methods suggest this)</p>	<p>May leave in minutes</p> <p>Accept rounding 8mins 40 seconds to 8 or 9 minutes</p> <p>Condone adding 13.1 x 20</p> <p>Allow follow through from <i>their</i> answer Must be based on evidence</p>	<p>R2 A1 I1</p> <p>R3 A1 I1</p>
	Checking	2	2 A clear check of a calculation or		
	Analyse		1 Statement that an answer is reasonable, or 3 correct calculations that would lead to an acceptable answer throughout the task or		A2
			0 Fewer than 3 correct calculations and no checks		A2
Total		20		Total	7 7 6

Some evidence that may be seen in answering the task.

Part	On evidence of	Notes
a(i)	Sula	
a(ii)	2 hours 7 minutes	
b(i)	Emma – mean 1hr 41mins 30 secs range 7 mins Jane – range 5 mins Ravinder – range 7 mins Sula – range 21 mins	Must show working and not just give 1h 41.5min oe Must change 101.5min to hours and minutes.
b (ii)	Jane – mean = 1 hr 48mins Ravinder – mean = 1 hr 56 mins Sula – mean = 1 hr 55 mins Emma – mean 1hr 41mins 30 secs Or observation Statement of conclusion – Emma is likely to win the race	
c	Calculation of times for all 4 runners using both Predictor 1 and predictor 2 Correct use of Predictor 1 to calculate all 4 marathon times Calculate 2x fastest ½ marathon + 20secs per mile NB $20 \times 26.2 = 524s = 8min\ 44s$ Jane 210mins = 3hrs39mins Ravinda 231mins = 3hrs51mins Sula 219mins = 3hrs41mins Emma 205mins = 3hrs25mins Correct use of Predictor 2 to calculate all 4 marathon times Jane 235mins = 3hrs55mins Ravinda 280mins = 4hrs40mins Sula 255mins = 4hrs15mins Emma 225mins = 3hrs45mins Statement that Jane and Emma are most likely to run under 4 hours as both Predictors suggest this	May not convert into hours and minutes Accept rounding to 9 minutes rather than 8mins 44 secs Allow follow through from candidates answer

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