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Mark Scheme (Results)

June 2011

Functional Skills Mathematics
Level 2 (FSM02)

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June 2011
Publications Code FC028434
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Guidance for Marking Functional Mathematics Papers

General

- All candidates must receive the same treatment. You must mark the first candidate in exactly the same way as you mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- All the marks on the mark scheme are designed to be awarded. You should always award full marks if deserved, i.e. if the answer matches the mark scheme. You should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.

Applying the Mark Scheme

- The mark scheme has a column for **Process** and a column for **Evidence**. In most questions the majority of marks are awarded for the process the candidate uses to reach an answer. The evidence column shows the most likely examples you will see:
  if the candidate gives different evidence for the process, you should award the mark(s).
- **Finding 'the answer'**: in written papers, the demand (question) box should always be checked as candidates often write their 'final' answer or decision there. Some questions require the candidate to give a clear statement of the answer or make a decision, in addition to working. These are always clear in the mark scheme.
- If working is **crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.
- If there is a **choice of methods** shown, then marks should be awarded for the 'best' answer.
- A suspected **misread** may still gain process marks.
- It may be appropriate to **ignore subsequent work** (isw) when the candidate's additional work does not change the meaning of their answer. You are less likely to see instances of this in functional mathematics.
- You will often see correct working followed by an incorrect decision, showing that the candidate can calculate but does not understand the demand of the functional question. The mark scheme will make clear how to mark these questions.
- **Transcription** errors occur when the candidate presents a correct answer in working, and writes it incorrectly on the answer line; mark the better answer.

- **Follow through marks** must only be awarded when explicitly allowed in the mark scheme. Where the process uses the candidate's answer from a previous step, this is clearly shown. Speech marks are used to show that previously incorrect numerical work is being followed through, for example **'240'** means **their** 240.
- Marks can usually be awarded where **units** are not shown. Where units, including money, are required this will be stated explicitly. For example, 5(m) or (£)256.4 indicate that the units do not have to be stated for the mark to be awarded.
  - **Correct money notation** indicates that the answer, in money, must have correct notation to gain the mark. This means that money should be shown as £ or p, with the decimal point correct and 2 decimal places if appropriate.

    e.g. if the question working led to £12÷5,

    Mark as correct: £2.40 240p £2.40p

    Mark as incorrect: £2.4 2.40p £240p 2.4 2.40 240

  - Candidates may present their answers or working in many **equivalent** ways. This is denoted **o.e.** in the mark scheme. Repeated addition for multiplication and repeated subtraction for division are common alternative approaches. The mark scheme will specify the minimum required to award these marks.
  - A **range** of answers is often allowed :
    - [12.5,105] is the inclusive closed interval
    - (12.5,105) is the exclusive open interval
  - **Parts of questions:** because most FS questions are unstructured and open, you should be prepared to award marks for answers seen in later parts of a question, even if not explicit in the expected part.
  - Discuss any queries with your Team Leader.

- **Graphs**
  The mark schemes for most graph questions have this structure:

Process		Evidence
Appropriate graph or chart – (e.g. bar, stick, line graph,)	1	1 of
	or	linear scale(s), labels, plotting (2mm tolerance)
	2	2 of
	or	linear scale(s), labels, plotting (2mm tolerance)
	3	all of
		linear scale(s), labels, plotting (2mm tolerance)

The mark scheme will explain what is appropriate for the data being plotted.

A **linear scale** must be linear **in the range where data is plotted,** whether or not it is broken, whether or not 0 is shown, whether or not the scale is shown as broken. Thus a graph that is 'fit for purpose' in that the **data is displayed clearly and values can be read**, will gain credit.

The minimum requirements for **labels** will be given, but you should give credit if a title is given which makes the label obvious.

Plotting must be correct for the candidate's scale. Award the mark for plotting if you can read the values clearly, even if the scale itself is not linear.

The mark schemes for **Data Collection Sheets** refer to **input opportunities** and to **efficient input opportunities.** When a candidate gives an input opportunity, it is likely to be an empty cell in a table, it may be an instruction to 'circle your choice', or it may require writing in the data in words. These become efficient, for example, if there is a well-structured 2-way table, or the input is a tick or a tally rather than a written list.

Section A: Leisure centre

Question	Process	Mark	Mark Grid	Evidence
Q1(a)	All factors considered	1	A	Complete fitness **OR** (£)484 **OR** (£)44
Q1(b)	Offer price calculated or begins to reverse check from £850	1 or	B	'484'÷4 (=121) **OR** 2×'484' (=968) **OR** ('484'÷4)×3(=363) **OR** 850 – 484(=366) **OR** 44×12÷4(=132) '484' must be any annual figure, '44' must be any monthly figure from table (not 850)
	Complete process	2 or	BC	2×'484'– '121' (=847) **OR** '968' – 121÷4 (=847) **OR** '484' + '363' (=847) **OR** '968' – 850 (=118) **OR** ('484'÷4)×3(=363) **and** 850 – 484(=366) **OR** 2×44×12 – '132'
	Decision reached with correct figures	3	BCD	(£)847 or ft from '(a)' and correct decision **OR** (£)118 and (£)121 or ft from '(a)' and correct decision **OR** (£)366 and (£)363 or ft from '(a)' and correct decision
	Total marks for question	**4**		

	¼ of annual price	¾ of annual price	Total for 2 years
Fitness Direct	97	291	291 + 388 = 679
Fitness Direct off-peak	66.75	200.25	200.25 + 267 =467.25
Complete fitness	121	363	363 + 484 = 847
Complete fitness off-peak	90.75	272.25	272.25 + 363 = 635.25

Question	Process	Mark	Mark Grid	Evidence
Q2(a)	Begins to work out time	1 or	E	20 + 15 + 35 (= 70 mins) **OR** attempts to subtract at least two of the times from 9 am **OR** Chooses a time to set alarm and attempts to add on at least two of the times
	Considers mix of hours and minutes	2 or	EF	Converts '70 mins' to hours and minutes **OR** 1 hour 10 minutes seen **OR** 90 minutes seen **OR** attempts to subtract at least the 4 times from 9 am **OR** 2 hours 40 minutes seen **OR** 160 mins seen **OR** Attempts to add on at least the 4 times to their '6am' **OR** 5 20 (am)
	Gives time for alarm clock	3	EFG	6:20 (am) **OR** 6 20 oe **OR** Time before 6.20 with clear description of reason to arrive early at work.

Question	Process	Mark	Mark Grid	Evidence
Q2(b)	Process to convert between km and m or process to work out number of lengths in 1km	1 0	H	25 ÷1000 (= 0.025) **OR** $\frac{1}{40}$ k **OR** 1000×$^{8}/_{5}$ (=1600) **OR** 1000÷25(=40)
	Use of 1 length of pool or use of number of lengths per km	1	J	$^{8}/_{5}$ ÷ '0.025' **OR** '0.025' × $^{5}/_{8}$ **OR** '1600' ÷ 25 **OR** '40' ÷ $\frac{5}{8}$ **OR** '40' **×** $\frac{8}{5}$
	Correct number of lengths	1	K	64
	Total marks for question	**6**		

Question	Process	Mark	Mark Grid	Evidence
Q3	Works with ratios and fractions	1 or	L	Any one of : 11×0.5(=5.5), 1.25×1(=1.25), 4×10.1(+40.4), 2×4.7(=9.4), 2×2.5(=5)
	Considers amount of food eaten	2 or	LM	Any three of : 11×0.5(=5.5), 1.25×1(=1.25), 4×10.1(+40.4), 2×4.7(=9.4), 2×2.5(=5)
	Correct answer for protein eaten	3	LMN	(5.5+22.3+1.25+40.4+9.4+12.5+5) = **96.35** cao
	Uses information about protein	1 or	P	95 × (any value between 1.2 – 1.7) **OR** '96.35'÷95 **OR** '96.35'÷1.2
		2	PQ	[114, 161.5] **OR** 1.0142... (accept 1 with evidence of calculation) **OR** 80.29...
	Conclusion Process marks L **and** P must be awarded	1	R	Conclusion ft from supporting working
Total marks for question		**6**		

Section B: Horses

Q4(a)	Substitutes into formula	1 or	A	$(185^2 \times 160) \div 11877$ **OR** $185^2 \times 160$ (=5476000)
	Finds correct weight	2	AB	[460, 461.1] **or** $461\frac{19}{321}$
Q4(b)	Works with percentage weight of horse **or** works with ratio of food	1 or	C	0.02×400 (=8) oe **OR** $400 \div 5$ (=80)
	Works with percentage weight of horse **and** works with ratio of food	2 or	CD	$0.02 \times 400 \div 5$ **OR** $0.02 \times (400 \div 5)$ **OR** 1.6 or 1600
	Correct weight with units	3	CDE	1.6 kg **or** 1600 g
	Total marks for question	**5**		

Question	Process	Mark	Mark Grid	Evidence
Q5	Chooses an appropriate graph type : bar chart(s), line graph(s), frequency polygon(s)	1 or	F	one of: linear scale, clear labels, accurate plotting (±2mm) of points or bars
	Completes graph	2 or	FG	two of: linear scale, clear labels, accurate plotting (±2mm) of points or bars
		3	FGH	all of: linear scale, clear labels, accurate plotting (±2mm) of points or bars
	Total marks for question	**3**		

Q6	Works with lengths or with areas	1 or	J	3.6 ÷ 1.8 (=2) **OR** 1.8 + 1.8 oe 3.6 ÷ 1.2 (=3) **OR** 1.2 + 1.2 + 1.2 oe 3.6 ×3.6 (=12.96) **OR** 1.8 × 1.2 (=2.16) **OR** diagram showing 2 mats or 3 mats filling one side
	Finds number of mats	2	JK	6 (mats) **OR** 6 mats clearly seen in a diagram
	Uses price of mats and delivery charge	1 or	L	'6' × 45 + 18 (=288) **OR** '6' × (45 + 18) (=378) **OR** '6' × 63 (=378)
	Gives total price	2	LM	(£)288 **or** ft from '6'× 45 + 18
	Total marks for question	**4**		

Question	Process	Mark	Mark Grid	Evidence
Q7	Starts to set up table or list for input	1 or	N	Table or list linking : at least 3 horses with all events **OR** at least 2 events with all horses **OR** at least 12 times with suitable intervals
	Completes table or list for input	2	NP	Table or list linking : all horses with all events **OR** 18 times with suitable intervals
	Coordinates horses, events and times	1 or	Q	For at least 3 horses and all events. **or** for all horses and 2 events, three of : 10am start no overlaps sufficient time for each event breaks of at least 5 minutes
	Correctly completed table	2	QR	Completed correctly showing all 6 horses taking part in the 3 events with sufficient time for each event and at least 5 minutes between events for each horse with finish time before 12:30 (finish time can be implied)
Total marks for question		**4**		

Section C: Driving

Question	Process	Mark	Mark Grid	Evidence
Q8	Considers discounts	1 or	A	28.75 – 2 (=26.75) **OR** 25.80÷10 (=2.58) **OR** 0.9×25.80(=23.22) **OR** 8×25.8÷10 (=20.64) **OR** 0.9×8×25.8 (=185.76)
	Full correct process for A or B	2	AB	0.9×8×25.8 + 20 (=205.76) **OR** 9×(28.75 – 2) **(=**240.75)
	Considers C	1 or	C	10 × 22 (=220)
	Correct price for all schools	2	CD	(£)205.76 (A) **and** (£)240.75 (B) **and** (£)220 (C)
	Decision – Process marks A and C must be awarded	1	E	Correct decision ft from comparable figures
Q8	**ALT METHOD – price per lesson**			
	Considers discounts	1 or	A	28.75 – 2 (=26.75) **OR** 25.80÷10 (=2.58) **OR** 0.9×25.80 (=23.22) **OR** 8×25.8÷10 (=20.64) **OR** 0.9×8×25.8 (=185.76)
	Complete method for A or B	2 or	AB	'26.75'×9 (=240.75)**OR** 20**+**'23.22'×8 (=205.76) **OR** 20 + '185.76' (=205.76)
	Correct price for A or B	3 or	ABC	'205.76'÷10 (A) **OR** '240.75'÷10 (B)
	Correct price for A and B per hour	4	ABCD	(£)20.576 **and** (£)24.075
	Decision –Marks A and C must be awarded	1	E	Correct decision ft from supporting working
	Total marks for question	**5**		

Question	Process	Mark	Mark Grid	Evidence
Q9(a)	Finds equivalent fraction or find percentage	1 or	F	$^{43}/_{50}$ **OR** 43 × 2 (=86) **OR** $^{86}/_{100}$ **OR** $^{85}/_{100}$ × 50 (=42.5) **OR** $^{42.5}/_{50}$
	Both in an equivalent form	2	FG	$^{86}/_{100}$ and $^{85}/_{100}$ **OR** $^{43}/_{50}$ and $^{42.5}/_{50}$ **OR** 42.5 **OR** 86%
	Conclusion – Process mark F must be awarded	1	H	Correct decision ft from supporting working NB : Decision could be yes or no
Q9(b)	Starts to calculate mean	1 or	J	(37 + 45 + 48 +39 + 46 + 44 + 49 + 45) ÷ 8 **OR** 353 ÷ 8 **OR** Correct process to calculate mean
	Correct value for mean	2	JK	44.125 or 44
Q9(c)	Calculation – any reverse calculation or estimation	1	L	must be a different calculation eg. '44.125' × 8 **OR** 44 × 8 **OR** using an estimate to calculate the mean eg. (40+50+50+40+50+40+50+40)÷8
	Total marks for question	**6**		

Question	Process	Mark	Mark Grid	Evidence
Q10(a)	Works out discount	1 or	M	8.5 ÷ 3 (=2.833…) **OR** 17 ÷ 3 (=5.666…) **OR** $^{2}/_{3} \times 8.5$ **OR** $^{2}/_{3} \times 17$
	Gives total price and considers rounding	2	MN	(£)11.33 **or** (£)11.34
Q10(b)	Considers cost of petrol	1 or	P	50 ÷ 10 ×1.36 (=6.8) **OR** 100 ÷ 10 × 1.36 (=13.6)
	Gives total price	2	PQ	(£)12.3(0) **or** (£)19.1(0)
	Makes decision – Process mark P must be awarded **and** there must be an answer to (a)	1	R	Decision ft from supporting working and part (a)
	Total marks for question	**5**		

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Order Code FC028434 June 2011

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