edexcel

Mark Scheme (Results)

March 2012

Functional Skills Mathematics
Level 2 (FSM02)

Edexcel and BTEC Qualifications
Edexcel and BTEC qualifications come from Pearson, the world's leading learning company. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information, please call our GCE line on 0844 576 0025, our GCSE team on 0844 576 0027, or visit our qualifications website at www.edexcel.com. For information about our BTEC qualifications, please call 0844 576 0026, or visit our website at www.btec.co.uk.

If you have any subject specific questions about this specification that require the help of a subject specialist, you may find our Ask The Expert email service helpful.

Ask The Expert can be accessed online at the following link:

http://www.edexcel.com/Aboutus/contact-us/

Alternatively, you can speak directly to a subject specialist at Pearson about Edexcel qualifications on our dedicated English telephone line: 0844 372 2188.

Pearson: helping people progress, everywhere
Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

March 2012
Publications Code FC0301146

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 or	1 of linear scale(s), labels, plotting (2mm tolerance)
	2 or	2 of 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: Music evening

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q1a	R2	Works with 40 songs or time between 8 and midnight	1	A	40× length of song e.g. 40 × 2½ **or** 40 × 2.5(= 100 or 1hr 40 mins) **or** 40 × 150 (=6 000) **OR** 4 (hours) **OR** 240 (mins)
	R3	Starts to coordinate times	1 or	B	Adds at least three of '100', 30, 40, 45 **OR** subtracts at least two of '100', 30, 40, 45 from 240 **OR** starts to add at least two times from 8:00 **OR** starts to subtract at least two times from 12:00
	A1	Uses complete correct process to find total time for event	2 or	BC	'215' (mins) or 3 (hrs) 35 (mins) **OR** '140' – 30 – 40 – 45 (=25) Starts from 12:00 and deducts all times (= 8:25 start) **OR** Starts from 8:00 and adds all times (=11:35 finish)
	I2	Makes correct decision based on correct working	3	BCD	YES **AND** 2335 or 11:35 **OR** it will finish before midnight with 25 (mins) over **OR** 240 (mins) **and** 215 (mins) oe
Q1b	R1	Finds cost for posters or flyers by multiplication	1	E	((£)3.50 × 5 =) (£)17.5(0) **OR** ((£)16 × 2 =) (£)32
	A1	Finds cost for posters and flyers	1 or	F	((£)3.50×5=) (£)17.5(0) **AND (**(£)16×2=) (£)32 **or** (£)25 selected **OR** (£)42.5(0) **OR** (£)49.5(0)
	I1	Finds correct total cost	2	FG	£42.50 correct money notation
		Total marks for question	**7**		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q2a	R2	Starts to work with fractions	1 or	H	20 ÷ 5 (=4) **OR** $\frac{2}{5}$ of 20 **OR** 12 **OR** 8
	A1	Presents correct answer	2	HJ	12 with vocals **AND** 8 instrumental clearly identified
Q2b	R1	Starts to find cost	1	K	'12' × 1.05 (= 12.6) **OR** '8' × 1 **OR** 20× 1.10 (=22) **OR** 18 × 1.10 (= 19.8) **OR** 9 × 1.10 (=9.9) **OR** 20 × 1.17 (=23.4)
	R2	Works with one store	1 or	L	1 of '12.6' + '8' (= 20.6) **OR** 18 × 1.10 **or** '22' − 2 × 1.10 **or** 2 × '9.9'(= 19.8) **OR** Valid process for finding 15% (= 3.51) **OR** Valid process for finding 85% (= 19.89)
	A1	Works with two stores	2 or	LM	2 of '12.6' + '8' (= 20.6) **OR** 18 × 1.10 **or** '22' − 2 × 1.10 **or** 2 × '9.9'(= 19.8) **OR** Valid process for finding 15% (= 3.51) **or** 85% (= 19.89)
	A1	Works with all stores	3 or	LMN	All of '12.6' + '8' (= 20.6) **AND** 18 × 1.10 **or** '22' − 2 × 1.10 **or** 2 × '9.9'(= 19.8) **AND** Valid process for finding 15% (= 3.51) **or** 85% (= 19.89)
	I1	Finds correct costs	4	LMNP	(£)20.6, (£)19.8 **AND** (£)19.89
	I2	Makes correct ft decision on valid working, at least KLM scored	1	Q	e.g. Sing along ft indicated
Total marks for question			**8**		
Q3	A1	Finds balance entry	1	R	Clearly identifies − 25.74
Total marks for question			**1**		

Section B: Green energy

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q4	R2	Starts to use graph	1 or	A	At least two values from 53, 54, 55 and 57 **OR** difference of 2 or 3 Values can be indicated on graph
	A1	Uses graph effectively	2	AB	All values from 53, 54, 55 and 57 **OR** difference of 2 and 3 Ignore extra values but 53,54, 55 and 57 must be clearly linked to dates or correct quantities Values can be indicated on graph or implied from subsequent working
	A1	Starts to find cost of oil	1 or	C	'2' × 600 (=1200) **OR** '3' × 1000 (=3000) **OR** two of '53' × 600 (=31800), '55' × 600 (=33000), '54' × 1000 (=54000), '57' × 1000 (=57000) **OR** 858 **OR** 900
	I1	Full process to find cost of oil for one price	2 or	CD	'2' × 600 (=1200) **AND** '3' × 1000 (=3000) **OR** all of '53' × 600 (=31800), '55' × 600 (=33000), '54' × 1000 (=54000), '57' × 1000 (=57000) **OR** 858 **AND** 900
	I2	Makes decision on correct figures	3	CDE	No **AND** (£)42 or 4200(p) Note: (£)30 and (£)12 must be added to gain this mark
Total marks for question			**5**		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q5a	A1	Converts to common units	1	F	9600 **OR** 3200 **OR** 2 **OR** 1 **OR** works in cm for one dimension in roof **AND** panel May be seen on the diagram or in subsequent working
	R3	Process to find number of panels along one dimension of roof	1 or	G	Working may be seen on the diagram Uses a build-up method **OR** 9 given for number of panels **OR** Divides one roof dimension by one panel dimension **Must** use consistent units
	I2	Full process for whole roof	2	GH	working may be seen on the diagram Coordinates both panel dimensions with both roof dimensions e.g. 9 × 1 (=9) **OR** 4 × 3 (=12) **OR** 4.8 × 3.2 etc Working or drawing required for 9 or 12
	I1	Finds optimal solution	1	J	12 (panels)
Q5b	R1	Starts to work with average	1 or	K	(4000 + 3800 + 3600 + 4200 + 4500 + 3900) ÷ 6 (=4000) **OR** 4000 + 3800 + 3600 + 4200 + 4500 + 3900 (=24000) and 4000 × 6 (=24000) **OR** 0, −200, −400, +200, +500, −100 (=0)
	I2	Completes calculation	2	KL	Yes **AND** 4000 **OR** Yes **AND** 24000 from 2 calculations **OR** Yes **AND** sum of differences = 0
Q5c	A1	Calculates income	1	M	43.3 × 2800 (=121240 (p) **OR** (£)1212.40)
	I1	Rounds to nearest £	1	N	(£)1212
	A2	Shows a suitable check – reverse calculation or estimation	1	P	'1212' ÷ 0.433 **OR** '1212' ÷ 2800 **OR** 3000 × 0.4 **OR** any valid check for calculation given in M
		Total marks for question	**9**		

<table>
<tr><th>Question</th><th>Skills Standard</th><th>Process</th><th>Mark</th><th>Mark Grid</th><th>Evidence</th></tr>
<tr><td>Q6</td><td>R2</td><td>Starts to make a two-way table</td><td>1 or</td><td>Q</td><td>Starts to construct two-way table with headings OR
Summarises figures or tallies for the table (1, 2, 3, 4)</td></tr>
<tr><td></td><td>I1</td><td>Complete solution</td><td>2</td><td>QR</td><td>Completes table with headings and numbers or tallies e.g.

<table><tr><th></th><th>Oil</th><th>Electricity</th></tr><tr><td>Like solar</td><td>4</td><td>1</td></tr><tr><td>Don’t like solar</td><td>2</td><td>3</td></tr></table></td></tr>
<tr><td colspan="3">Total marks for question</td><td colspan="3">2</td></tr>
</table>

Section C: Bouncy castles and ball pits

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q7	R2	Process to convert to consistent currencies	1	A	Multiplies a number of dollars by 0.62 **OR** 1300 ÷ 0.62(=2096.77…)
	A1	Starts to total costs	1 or	B	e.g. 4 × 499 + 180 (= ($)2176) **OR** 4 × '309.38' +'111.6' (=(£)1349.12) condone 4 delivery charges: 4 × 499 + 4 × 180 (= ($)2716) oe
	I1	Makes a correct decision from correct figures	2	BC	No **and** ($)2176 **and** ($)[2096, 2097] **OR** No **and** (£)1349(.12)
		Total marks for question	**3**		
Q8	R1	Starts to find percentage of a quantity	1 or	D	9/100 × 135(=12.15) **OR** 20/100 × 135(=27) **OR** any valid method to find 20%, 9% shown
	R3	Includes cost plus import tax	2	DE	135 + '12.15' (= (£)147.15)
	A1	Finds VAT on total amount	1	F	20/100 × '147.15' (= (£)29.43)
	I2	Correct VAT and correct working	1	G	[(£)29.42, (£)29.44] with correct working
		Total marks for question	**4**		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q9a	R2	Substitute in formula	1 or	H	0.52 × 8 × 8 × 8 (=266.24)
	A1	Finds volume of ball	2	HJ	266.24 or a rounded value with reason
	A1	Works with method	1 or	K	300 000 ÷ '266.24'(=1126.8…) **OR** '266.24' × 1000 (=266 240) **OR** 300 000 ÷ 1000 (= 300)
	A1	Completes method	2 or	KL	0.85 × '1126.8'(=957.7…) **OR** 0.85 × 266 240 (=226 304) **OR**
	I2	Correct decision from correct figures	3	KLM	Yes and [950, 960] **OR** Yes and 226 304
Q9b	A1	Process to find probability	1 or	N	Uses 80 **and** 30+80+40+50(=200)
	A1	Finds probability	2	NP	$\frac{80}{200}$ oe
Q9c	R3	Starts to find time to inflate	1 or	Q	720 000 ÷ 27 000 (= 26.6…) **OR** 27 000 × 30(=810 000) **OR** 720 000 ÷ 30(=24 000)
	I2	Valid decision and accurate figures	2	QR	Yes and [26,27] **OR** Yes and 810 000 **OR** Yes and 24 000
Total marks for question			**9**		

Further copies of this publication are available from
Edexcel Publications, Adamsway, Mansfield, Notts, NG18 4FN

Telephone 01623 467467
Fax 01623 450481
Email publication.orders@edexcel.com

Order Code FC0301146 March 2012

For more information on Edexcel qualifications, please visit
www.edexcel.com/quals

Pearson Education Limited. Registered company number 872828
with its registered office at Edinburgh Gate, Harlow, Essex CM20 2JE

Ofqual

Llywodraeth Cynulliad Cymru
Welsh Assembly Government

Rewarding Learning