Mark Scheme (Results)

May 2018

Functional Skills Mathematics Level 2

FSM02

Pearson

Functional Skills Qualifications from Pearson

Functional Skills qualifications 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 visit our qualifications website at qualifications.pearson.com. Alternatively, you can get in touch with us using the details on our contact us page.

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 our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

Guidance for Marking Functional Skills Maths 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- If working is **crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.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 mark the working leading to the answer given in the answer box or working box. If there is no definitive answer then marks should be awarded for the 'lowest' scoring method shown.
- 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 his or her answer.
- You will often see correct working followed by an incorrect decision, showing that the candidate can calculate but does not understand the functional demand of the 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 in a written paper); mark the better answer.
- **Incorrect method** if it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review for your Team Leader to check.
- **Follow through marks (ft)** 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 indicates that the units do not have to be stated for the mark to be awarded.

FUNCTIONAL SKILLS (MATHEMATICS)
MARK SCHEME – LEVEL 2 – MAY 2018

- **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 2.40£   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 **oe** 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
- **Parts of questions:** because most FS questions are unstructured and open, you should be prepared to award marks for answers seen in other parts of a question, even if not explicit in the expected part. E.g. checks in on earlier answer box.
- **Graphs**
  The mark schemes for most graph questions have this structure:

Process	Mark	Evidence
Appropriate graph or chart – (e.g. bar, stick, line graph)	1 or	1 of: linear scale(s), labels, accurate plotting (2 mm tolerance)
	2 or	2 of: linear scale(s), labels, accurate plotting (2 mm tolerance)
	3	all of: linear scale(s), labels, accurate plotting (2 mm 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,** and use consistent intervals. The scale may not start at 0 and not all intervals must be labelled. Thus a graph that is 'fit for purpose' is one where 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. Candidate's scale must be in numerical order. Award the mark for plotting if you can read the values, even if the scale is not linear.

FUNCTIONAL SKILLS (MATHEMATICS)
MARK SCHEME – LEVEL 2 – MAY 2018

The mark schemes for **Data Collection and/ or summary 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.

Discuss any queries with your Team Leader.

Section A: Car trader

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q1(a)	R3	Process to work with mean	1	A	$(31 + 28 + 46 + 52 + 44 + 62) ÷ 6$ (=43.83..) **OR** $31 + 28 + 46 + 52 + 44 + 62$ (=263) **AND** $42 × 6$ (=252)
	A4	Process to work with fraction	1	B	$62 ÷$ '263' (=0.23..) **OR** '263' $÷ 5$ (=52.6) **OR** '263' $÷ 62$ (= 4.2..)
	I6	Accurate figure found	1 or	C	43(.83..) **or** 263 and 252 **OR** 0.23(57..) oe **or** 52(.6) **OR** 4.2(..)
	I7	Correct answer with accurate figures	2	CD	Yes **AND** 43(.83..) **AND** 0.23(57..) oe (**and** 0.2 oe) **or** 52(.6) (**and** 62 can be indicated in the table) **or** 4.2(..) explained **OR** Yes **AND** 263 and 252 **AND** 0.23(57..) oe (**and** 0.2 oe) **or** 52(.6) (**and** 62 can be indicated in the table) **or** 4.2(..) explained

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q1(b)	R1	Process to find bonus for the extra cars sold	1	E	$(114 - 94) \times 150$ (=3000)
	A4	Process to work with percentage or partial bonus	1 or	F	$1.75 \div 100 \times 316\ 400$ (=5537) oe **OR** $8000 - '3000'$ (=5000) condone correct percentage calculation for an appropriate monetary value
	A4	Full process to find figures to compare	2 or	FG	e.g. '5537' + '3000' (=8537) **OR** '5000' ÷ 316 400 × 100 (=1.58..%) **OR** 8000 – '5537' (=2463) **and** (114 – 94) × 150 (=3000) **OR** (8000 – '5537') ÷ 150 (=16.42) **and** 114 – 94 (=20) **OR** 1.75 ÷ 100 × 316 400 (=5537) oe **and** 8000 – '3000' (=5000)
	I7	Correct answer with accurate figures	3	FGH	e.g. Yes **AND** (£)8537 **OR** Yes **AND** 1.5(8.. %) **OR** Yes **AND** (£)2463 **and** (£)3000 **OR** Yes **AND** 16(.42) **and** 20 (cars) **OR** Yes **AND** (£)5537 **and** (£)5000
Total marks for question			**8**		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q2	R3	Begins to work with ratio	1 or	J	114 – 19 – 57 (= 38) oe **OR** 19 : 57 (: C) oe
	A4	Full process to work with ratio	2 or	JK	e.g. 19 : 57 : '38' oe **OR** A = 19 **and** B = 57 **and** C = '38'
	I6	Correct answer	3	JKL	1 : 3 : 2
Total marks for question			3		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q3	R2	Works with one relevant area	1 or	M	e.g. 82 × 62.5 (=5125) **OR** 49.75 × 42.5 (=2114.375) **OR** 39.5 × 62.5 (=2468.75) **OR** 82 × 12.75 (=1045.5) **OR** 49.75 × 39.5 (=1965.125) **OR** 42.5 × 12.75 (=541.875)
	A4	Full process to find total area or one relevant volume	2 or	MN	e.g. '5125' – '2114.375' (=3010.625) **OR** '2468.75' + '541.875' (=3010.625) **OR** '1045.5' + '1965.125' (=3010.625) **OR** '2468.75' × 0.09 (=222.1875) **OR** '541.875' × 0.09 (=48.76875)
	R1	Full process to find the figures to compare	3 or	MNP	e.g. '3010.625' × 0.09 (=270.95625) oe **OR** '222.1875' + '48.76875' (=270.95625) oe
	I6	Accurate figure	4	MNPQ	270 (.95..) or 271 (m^3)
	A5	Valid check	1	R	Valid check, e.g. reverse calculation or alternative method or estimation
Total marks for question			**5**		

Section B: Theatre

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q4(a)	R1	Begins to substitute in the formula	1 or	A	$180 + 0.9 \times 70$ (=243)
	A4	Full substitution in the formula	2	AB	$6500 \div (180 + 0.9 \times 70)$ (=26.74..)
	R3	Begins to work with stall seat ticket	1 or	C	$0.6 \times$ '26.74..' (=16.04..) **OR** '26.74..' $\times 45$ (=1203.70..)
	A4	Full process to find total income from stall seats	2 or	CD	'16.04..' $\times 45$ (=722.22..) **OR** '1203.70..' $\times 0.6$ (=722.22..)
	I6	Correct answer in correct money notation (allow appropriate and functional early rounding)	3	CDE	£722.22 **or** £722.23 **or** £722.25 **or** £721.80 **or** £721.98 in correct money notation
Q4(b)	A5	Valid explanation	1	F	Valid explanation, e.g. the price will decrease oe e.g. the price I have worked out is more than I need to pay oe

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q4(c)	R2	Begins to design data collection sheet	1 or	G	Input opportunities **and at least** 2 headings for: • gender • age • rating **OR** Input opportunities **and at least** 2 headings for • F,M • 16-24, 25+ • excellent, good, poor
	I6	Improves data collection sheet	2 or	GH	Input opportunities **and** all of: male/female 16-24, 25+ excellent, good, poor May not be efficient - could be a questionnaire
	I6	Efficient data collection sheet	3	GHJ	Fully correct and efficient collection sheet
Total marks for question			**9**		

Example of fully correct answer to Q4c

	(gender)	M(ale)			F(emale)	
	(age)	16 - 24	25+		16 - 24	25+
	E(xcellent)					
(rating)	G(ood)					
	P(oor)					

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q5	R1	Completes the key	1	K	0.5 (m) indicated oe
	R2	Begins to work with scale	1 or	L	At least 2 of: Bottom wall 13.5 square lengths Right wall 4.5 square lengths Top wall 7 or 9 square lengths Diagonal wall 5.1 square lengths Door 2 square lengths **OR** Correctly uses their incorrect scale for 2 different measurements
	A4	Develops the diagram	2 or	LM	3 or 4 of: Bottom wall 13.5 square lengths Right wall 4.5 square lengths Top wall 7 or 9 square lengths Diagonal wall 5.1 square lengths Door 2 square lengths **OR** Correctly uses their incorrect scale for 4 different measurements
	I6	Fully correct scale diagram	3	LMN	Fully correct diagram 3
Total marks for question			**4**		

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q6	R3	Begins to work with proportion	1 or	P	e.g. 1.49 ÷ 60 (=0.0248..) oe **or** 3.99 ÷ 150 (=0.0266) oe **or** 5.99 ÷ 250 (=0.02396) oe **OR** 60 ÷ 1.49 (=40.26) oe **or** 150 ÷ 3.99 (=37.59) oe **or** 250 ÷ 5.99 (=41.73..) oe **OR** 150 ÷ 250 (=0.6) **or** 150 ÷ 60 (=2.5)
	A4	Full process to find figures to compare	2 or	PQ	e.g. 3.99 ÷ 150 (=0.0266) **and** 5.99 ÷ 250 (=0.02396) **or** 1.49 ÷ 60 (=0.0248..) **OR** 150 ÷ 3.99 (=37.59) **and** 60 ÷ 1.49 (=40.26) **or** 250 ÷ 5.99 (=41.73..) **OR** 150 ÷ 250 × 5.99 (=3.594) **or** 150 ÷ 60 × 1.49 (=3.725) **OR** 60 ÷ 150 × 3.99 (=1.596) **OR** 250 ÷ 150 × 3.99 (=6.65)
	I7	Valid conclusion with accurate figures	3	PQR	e.g. No **AND** (£)0.026(6) **and** (£)0.024(8..) **or** (£)0.023(9..)) **OR** No **AND** 37(.59) **and** 40(.26) **or** 41(.73) oe (g/£) **OR** No **AND** (£)3.5(94) **or** (£)3.7(25) **OR** No **AND** (£)1.59(6) **OR** No **AND** (£)6.6(5)
Total marks for question			**3**		

Section C: Garden party

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q7(a)	I6	Begins process to work with lengths in 1 direction	1 or	A	e.g. 3×150 (=450) **OR** 2×50 (=100) **OR** 3×90 (=270)
	R3	Full process to show the length in 2 directions or in 1 direction with gaps	2 or	AB	e.g. $2 \times 50 + 3 \times 150$ (=550) **OR** $2 \times 50 + 90$ (=190) **OR** $2 \times 50 + 3 \times 90$ (=370) **OR** $2 \times 50 + 150$ (=250) **OR** 3×150 (=450) **and** 3×90 (=270) condone use of 1×50 for this mark
	A4	Full process to show the length in 2 directions of the area that needs to be covered	3	ABC	e.g. $2 \times 50 + 3 \times 150$ (=550) **AND** $2 \times 50 + 90$ (=190) **OR** $2 \times 50 + 3 \times 90$ (=370) **AND** $2 \times 50 + 150$ (=250) **OR** '600' $- 2 \times 50 + 3 \times 150$ (=50) **OR** '300' $- 2 \times 50 + 90$ (=110) **OR** '400' $- 2 \times 50 + 3 \times 90$ (=30) **OR** '400' $- 2 \times 50 + 150$ (=150)
	A4	Full process to find figures to compare	1 or	D	$2 \times 67 + 49.95$ (=183.95) **OR** $2 \times 74 + 39.99$ (=187.99) **OR** $2 \times 59 + 41.99$ (=159.99)
	I7	Valid conclusion with accurate figures	2	DE	(Marquee) A **AND** (£)183(.95) **AND** (£)187(.99) withhold E if an arithmetic error is seen

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q7(b)	R1	Begins to work with prices	1	F	e.g. $(80 - 49) \times 19.95$ (= 618.45) **OR** 49×14.95 (=732.55) **OR** $14.95 \div 3$ (=4.983..) **OR** $19.95 \div 3$ (=6.65) NB allow use of 0.33 or better. This mark may be implied by subsequent working.
	A4	Develops solution	1 or	G	e.g. '618.45' + '732.55' (=1351) **OR** '618.45' $\div$ 3 (=206.15) **OR** '732.55' $\div$ 3 (=244.18..) **OR** '4.98..' $\times$ 49 (=244.18..) **OR** '6.65' $\times$ (80 – 49) (=206.15) **OR** '4.983..' $\times$ 2 (=9.96..) **OR** '6.65' $\times$ 2 (=13.3) **OR** $1000 \times 3 \div 2$ (=1500)
	R2	Full process to find figures to compare	2 or	GH	e.g. '1351' $\div$ 3 $\times$ 2 (=900.66..) oe **OR** ('206.15' + 244.18..') $\times$ 2 (=900.66..) **OR** '9.96..' $\times$ 49 + '13.3' $\times$ (80 – 49) (=900.66..) **OR** 618.45' + '732.55' (=1351) **and** $1000 \times 3 \div 2$ (=1500)
	I7	Valid conclusion with accurate figures	3	GHJ	Yes **AND** (£)900(.66..) **or** (£)901 **OR** Yes **AND** (£)1351 **and** (£)1500
Total marks for question	**9**				

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q8	R2	Begins to work with time	1 or	K	adds at least 3 times, e.g. 1h 30 min + 10 + '15' (=1h 55 min) **OR** adds at least 2 times to 11:45, e.g. 11:45 + '90' + 13 (=13:28) **OR** subtracts at least 2 times from 2:30, e.g. 2:30 – 16 – '15' (=1:59) **OR** 2:30 – 11:45 (=2 h 45 min) oe
	A4	Full process to find figures to compare	2 or	KL	e.g. 11:45 + '90' + 13 + 10 + 12 + '15' + 16 (=14:21) **OR** 2:30 − '90' − 13 − 10 − 12 − '15' − 16 (=11:54) **OR** 2:30 – 11:45 (=2 h 45 min) oe **AND** '90' + 13 + 10 + 12 + '15' + 16 (= 2 h 36 min) oe
	I7	Valid conclusion with accurate figures	3	KLM	Yes **AND** 14:21 oe **OR** Yes **AND** 11:54 oe **OR** Yes **AND** 2 h 45 min **and** 2 h 36 min oe Yes **AND** 9 (minutes to spare)
Total marks for question			**3**		

Example of timeline for Q8:

11:45 (90) 13:15 (13) 13:28 (10) 13:38 (12) 13:50 (15) 14:05 (16) 14:21

Question	Skills Standard	Process	Mark	Mark Grid	Evidence
Q9(a)	R3	Process to convert from kg to pounds	1 or	N	0.75×2.2 (=1.65) oe
	I6	Accurate figure	2	NP	1.65 (pounds) oe
	A5	Valid check	1	Q	Valid check, e.g. reverse calculations or alternative method
Q9(b)	I6	Correct answer in correct notation	1	R	$\frac{67}{150}$ **or** [0.44, 0.45] **or** [44, 45] %
Total marks for question			**4**		

Ofqual

Llywodraeth Cynulliad Cymru
Welsh Assembly Government

CCEA
Rewarding Learning