

Mark Scheme (SAMS)

September 2015

Pearson Edexcel Functional Skills  
Mathematics CBT Level 2 (MAT02)

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May 2015

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**FUNCTIONAL SKILLS ONSCREEN (MATHEMATICS)**  
**MARK SCHEME – LEVEL 2 – SAM 2015**

**Guidance for Marking Functional Mathematics Onscreen**

**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 onscreen tests, many questions have a mechanism for the candidate to give their decision or answer, as well as the working box. In most cases the marks are awarded for the process which leads to the answer. Full marks cannot be gained from simply clicking the correct answer. You must read what is in the working box. You may need to award marks for an answer which is only stated in the working box.
- 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  $£12 \div 5$ ,

**FUNCTIONAL SKILLS ONSCREEN (MATHEMATICS)  
MARK SCHEME – LEVEL 2 – SAM 2015**

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 Marker Leader / Assistant Marker Leader.
- **Graphs**  
The mark schemes for most graph questions have this structure:

Process		Evidence
	1 or	1 of linear scale(s), labels, plotting ( $\pm 1$ small square)
	2 or	2 of linear scale(s), labels, plotting ( $\pm 1$ small square)
	3	all of linear scale(s), labels, plotting ( $\pm 1$ small square)

- Note that the mechanism usually restricts the candidate's choice of graph.
- 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.

**FUNCTIONAL SKILLS ONSCREEN (MATHEMATICS)  
MARK SCHEME – LEVEL 2 – SAM 2015**

Question	Skill Standard	Process	Mark	Evidence
Q1	R1	Begins process to find one third or two thirds of normal price	1 or	$69.90 \div 3 (=23.3)$
	A4	Complete process to find sale price	2 or	$69.90 - '23.3' (=46.6)$ <b>OR</b> $69.90 \div 3 \times 2 (=46.6)$
	I6	Correct answer in correct money notation	3	£46.60 (in correct money notation)
<b>Total marks for question</b>			<b>3</b>	

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MARK SCHEME – LEVEL 2 – SAM 2015**

Question	Skill Standard	Process	Mark	Evidence
Q2	R1	Converts units	1 or	Shape with at least 5 sides and 3 internal right angles and at least 4 correct sides of: 11, 10, 5, 7, 16, 17 (in order, clockwise or anti-clock wise) <b>OR</b>  L shape with sides of 5.5, 5, 2.5, 3.5, 8, 8.5 (in order, clockwise)
	I6	Uses scale to improve solution	2 or	Shape with 6 sides and 5 internal right angles and 1 external right angle and at least 4 correct sides of: 11, 10, 5, 7, 16, 17 (in order, clockwise or anti-clock wise) <b>OR</b>  Correct L shape reflected
	A5	Correctly constructs and checks shape to scale	3	Fully correct L shape
<b>Total marks for question</b>			<b>3</b>	

**FUNCTIONAL SKILLS ONSCREEN (MATHEMATICS)**  
**MARK SCHEME – LEVEL 2 – SAM 2015**

<b>Question</b>	<b>Skill Standard</b>	<b>Process</b>	<b>Mark</b>	<b>Evidence</b>
<b>Q3(a)</b>	R3	Full process for total calories used	1 or	$6 \times 5 \times 3 + 8 \times 5 (=130)$ oe
	A4	Full process to find calories used for 20 min period when watching TV	2	$72 \div 60 \times 20 (= 24)$ <b>OR</b> $72 \div 3 (= 24)$ <b>OR</b> '130' – 100 (=30)
	I7	Full process to compare	1	Yes <b>and</b> 106 <b>OR</b> Yes <b>and</b> 30 <b>and</b> 24
<b>Q3(b)</b>	A5	Valid check	1	E.g. one reverse process or alternative method
<b>Total marks for question</b>			<b>4</b>	

**FUNCTIONAL SKILLS ONSCREEN (MATHEMATICS)  
MARK SCHEME – LEVEL 2 – SAM 2015**

Question	Skills Standard	Process	Mark	Evidence
<b>Q4</b>	R2	Process to find length of one ribbon border	1 or	$148 - 2 \times 7.5 (=133)$ oe <b>OR</b> $4 \times 7.5(=30)$
	A4	Process to find total length of border	2 or	$(105 + '133') \times 2 (=476)$ oe <b>OR</b> $105 + 148 + 105 + 148 - 30(=476)$
	R1	Process to find total length required	3	'476' $\times 50 (=23800)$
	I6	Process to find number of rolls	1 or	'23800' $\div 4000 (=5.95)$ <b>OR</b> $6 \times 4000(=24000)$
	I7	Accurate answer	2	Yes <b>AND</b> 5.95 (rolls) <b>OR</b> Yes <b>AND</b> 23800 (mm) <b>and</b> 24000 (mm) oe
<b>Total marks for question</b>			<b>5</b>	



**FUNCTIONAL SKILLS ONSCREEN (MATHEMATICS)  
MARK SCHEME – LEVEL 2 – SAM 2015**

Question	Skills Standard	Process	Mark	Evidence
Q5	R1	Process to find a multiplier	1 or	$60 \div 20 (=3)$ <b>or</b> $20 \div 10 (=2)$ <b>or</b> $2 \div 5 (=0.4)$
	A4	Process to use multiplier	2 or	'3' $\times 10 \div 5 \times 2 (=12)$ <b>OR</b> $60 \div '2' \div 5 \times 2 (=12)$ <b>OR</b> '0.4' $\times '30' (=12)$ oe
	I6	Correct answer, units required	3	12 pounds (units required)
<b>Total marks for question</b>			<b>3</b>	

**FUNCTIONAL SKILLS ONSCREEN (MATHEMATICS)  
MARK SCHEME – LEVEL 2 – SAM 2015**

Question	Skills Standard	Process	Mark	Evidence
<b>Q6</b>	R1	Begins process to choose within constraints	1 or	<p>Chooses one activity from each session. At least <b>one</b> total is correct but does not meet constraints.</p> <p><b>OR</b></p> <p>Chooses more than one activity from each session (e.g. two from morning and one from evening) <b>BUT</b> they meet the constraints and <b>both</b> totals are present and correct.</p> <p><b>OR</b></p> <p>Chooses one of the following combinations with totals blank or incorrect e.g.</p> <p>Canoeing, Archery, Bird watching 6 h 30 min, 100</p> <p>Canoeing, Sailing, Bird watching 6 h 30 min, 92</p>
	A5	Checks to improve choice	2 or	<p>Chooses one activity from each session <b>AND</b></p> <p>both totals correct but <b>one</b> is outside constraints</p> <p><b>or</b></p> <p>both totals are inside constraints but <b>one</b> is incorrectly added</p>
	I6	Finds a correct solution	3	<p>Chooses one activity from each session <b>and</b> both totals correct and inside constraints.</p> <p><b>Solutions are:</b></p> <p>Canoeing (M), Archery, Nature walk: 6(hr) 30 (min), (£)100</p> <p>Canoeing (M), Sailing, Nature walk: 6(hr) 30(min), (£)92</p>
<b>Total marks for question</b>			<b>3</b>	

**FUNCTIONAL SKILLS ONSCREEN (MATHEMATICS)  
MARK SCHEME – LEVEL 2 – SAM 2015**

<b>Question</b>	<b>Skills Standard</b>	<b>Process</b>	<b>Mark</b>	<b>Evidence</b>
<b>Q7(a)</b>	R3	Process to find total number of plants that can grow or are grown or starts to compare percentage probabilities	1 or	$10 \times 8 (=80)$ <b>OR</b> $5 + 7 + 7 + 0 + 7 + 6 + 8 + 4 (=44)$ <b>OR</b> $50 + 70 + 70 + 0 + 70 + 60 + 80 + 40 (=440)$
	A4	Full process to find figures to compare	2 or	$80 \times 60 \div 100 (=48)$ <b>OR</b> '440' $\div 8 (=55)$ <b>OR</b> '440' $\div$ '80' $\times 100 (=55)$
	I7	Gives accurate figures and compares	3	Less and 44 and 48 <b>OR</b> Less and 55%
<b>Q7(b)</b>	I7	Provides a justification	1	E.g. In more than half the trays she grew 60% or better <b>OR</b> the mode is 7 <b>OR</b> the median is 6.5 <b>OR</b> Do not include tray D and then the probability is greater than 60%
<b>Total marks for question</b>			<b>4</b>	

**FUNCTIONAL SKILLS ONSCREEN (MATHEMATICS)  
MARK SCHEME – LEVEL 2 – SAM 2015**

<b>Question</b>	<b>Skills Standard</b>	<b>Process</b>	<b>Mark</b>	<b>Evidence</b>
<b>Q8(a)</b>	R1	Process to find correct percentage multiplier	1 or	Uses 84%
	R3	Process to use multiplier to find output from a single panel	2 or	'84' $\times$ 200 $\div$ 100 (= 168W) <b>OR</b> 16 $\times$ 200 (= 3200)
	A4	Process to change units	3	3 $\times$ 1000 = 3000 <b>OR</b> '168' $\div$ 1000(=0.168) <b>OR</b> '3200' $\div$ 1000(=3.2)
	A4	Process to calculate number of panels or maximum output	1 or	3000 $\div$ '168' (=17.8...) <b>OR</b> 16 $\times$ '0.168'(=2.688) <b>OR</b> 3.2 $\times$ 0.84(=2.688) oe
	I7	Valid conclusion and accurate figures	2	No <b>and</b> 17.8 <b>or</b> 18 (panels) <b>OR</b> No <b>and</b> 2.688 (kW) oe
<b>Q8(b)</b>	A5	Valid check	1	E.g. Reverse process or alternative method or estimation.
<b>Total marks for question</b>			<b>6</b>	

**FUNCTIONAL SKILLS ONSCREEN (MATHEMATICS)  
MARK SCHEME – LEVEL 2 – SAM 2015**

Question	Skills Standard	Process	Mark	Evidence
<b>Q9</b>	R1	Process to substitute in the formula	1 or	225 (×) T = 125 × 81 (=10125) <b>or</b> 81 – 32 (=49)(min)
	A4	Process to find figures to compare	2 or	‘10125’ ÷ 225 (=45)(min) <b>and</b> 81 – 32 (=49)(min) <b>OR</b> ‘10125’ ÷ 225 (=45)(min) <b>and</b> 81 – 45 (=36)(min)
	I7	Correct decision based on accurate figures	3	Yes <b>and</b> 45(min) <b>and</b> 49(min) <b>OR</b> Yes <b>and</b> 36 (min)
<b>Total marks for question</b>			<b>3</b>	

**FUNCTIONAL SKILLS ONSCREEN (MATHEMATICS)  
MARK SCHEME – LEVEL 2 – SAM 2015**

Question	Skills Standard	Process	Mark	Evidence
<b>Q10</b>	R1	Begins to consider constraints for rota	1 or	1 of: C Jen 9 -12., F Les 9-12, I Dave 7-9, D Hope 1-5, V Dave 1-4, W Sam 9-12 <b>OR</b> C Les 9-12, F Sam 9-12, I Dave 7-9, D Hope, 1-5, V Dave 1-4, W Jen 9 -12 <b>OR</b> C Jen 9 -12., F Sam 9-12, I Dave 7-9, D Hope 1-5, V Dave 1-4, W Les 9-12 <b>OR</b> C Les 9-12, F Jen 9-12, I Dave 7-9, D Hope, 1-5, V Dave 1-4, W Sam 9 -12
	I6	Improves rota	2 or	3 of: C Jen 9 -12., F Les 9-12, I Dave 7-9, D Hope 1-5, V Dave 1-4, W Sam 9-12 <b>OR</b> C Les 9-12, F Sam 9-12, I Dave 7-9, D Hope, 1-5, V Dave 1-4, W Jen 9 -12 <b>OR</b> C Jen 9 -12., F Sam 9-12, I Dave 7-9, D Hope 1-5, V Dave 1-4, W Les 9-12 <b>OR</b> C Les 9-12, F Jen 9-12, I Dave 7-9, D Hope, 1-5, V Dave 1-4, W Sam 9 -12
	A5	Fully correct and checked rota	3	All of: C Jen 9 -12., F Les 9-12, I Dave 7-9, D Hope 1-5, V Dave 1-4, W Sam 9-12 <b>OR</b> C Les 9-12, F Sam 9-12, I Dave 7-9, D Hope, 1-5, V Dave 1-4, W Jen 9 -12 <b>OR</b> C Jen 9 -12., F Sam 9-12, I Dave 7-9, D Hope 1-5, V Dave 1-4, W Les 9-12 <b>OR</b> C Les 9-12, F Jen 9-12, I Dave 7-9, D Hope, 1-5, V Dave 1-4, W Sam 9 -12

**FUNCTIONAL SKILLS ONSCREEN (MATHEMATICS)  
MARK SCHEME – LEVEL 2 – SAM 2015**

<b>Total marks for question</b>	<b>3</b>
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Question	Skills Standard	Process	Mark	Evidence
<b>Q11(a)</b>	R2	Process to calculate total mileage of cars	1 or	$9 \times 19200 (= 172800)$
	A4	Process to calculate CO2 emissions	2 or	'172800' $\times$ 150 (= 25920000)
	R3	Process to convert grams into tonnes	3 or	'25920000' $\div$ 1000 $\div$ 1000(=25.92)
	I6	Correct answer to 1 d.p.	4	25.9 (tonnes)
<b>Q11(b)</b>	A5	Valid check	1	E.g. one reverse calculation
<b>Total marks for question</b>			<b>5</b>	

**FUNCTIONAL SKILLS ONSCREEN (MATHEMATICS)  
MARK SCHEME – LEVEL 2 – SAM 2015**

<b>Question</b>	<b>Skills Standard</b>	<b>Process</b>	<b>Mark</b>	<b>Evidence</b>
<b>Q12</b>	R2	Process to find volume of floor or number of bags he can pay for	1	$5.5 \times 6 \times 0.1 (=3.3) \text{ (m}^3\text{)}$ <b>OR</b> $150 \div 4.99(=30.06..)$
	A4	Process to find weights of material or number of bags he can get	1 or	'3.3' $\times$ 300 (=990) (kg) <b>OR</b> '30' $\div$ 4(=7.5) <b>and</b> '30' + '7.5' (=37)(bags)
	I6	Process to find number of bags or total weight he can buy	2	'990' $\div$ 25 (=39.6 or 40) <b>OR</b> '37' $\times$ 25(=925)
	R3	Process to find number of concrete bags to pay for or volume of concrete he can make	1	'40' - '40' $\div$ 5 (=32)oe <b>OR</b> '925' $\div$ 300(=3.08..)
	A4	Process to find total cost or depth	1 or	'32' $\times$ 4.99(=159.68) <b>OR</b> '3.08..' $\div$ 5.5 $\div$ 6(=0.093..) Condone '40' $\times$ 4.99(=199.60)
	I7	Valid conclusion with accurate figures	2	E.g. No <b>and</b> (£)159.68 <b>OR</b> No <b>and</b> 9.3 (cm depth)  NB There are other valid comparisons
<b>Total marks for question</b>			<b>6</b>	



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