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Functional Skills Level 2
MATHEMATICS
8362/2

Paper 2 Calculator

Mark scheme

June 2022

Version: 1.0 Final

226A8362/2/MS

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this mark scheme are available from aqa.org.uk

Glossary for Mark Schemes

Functional Skills examinations are marked in such a way as to award positive achievement wherever possible. Thus, for Functional Skills Mathematics papers, marks are awarded under various categories.

If a student uses a method which is not explicitly covered by the mark scheme the same principles of marking should be applied. Credit should be given to any valid methods. Examiners should seek advice from their senior examiner if in any doubt.

M	Method marks are awarded for a correct method which could lead to a correct answer.
A	Accuracy marks are awarded when following on from a correct method. It is not necessary to always see the method. This can be implied.
B	Marks awarded independent of method.
ft	Follow through marks. Marks awarded for correct working following a mistake in an earlier step.
SC	Special case. Marks awarded for a common misinterpretation which has some mathematical worth.
M dep	A method mark dependent on a previous method mark being awarded.
B dep	A mark that can only be awarded if a previous independent mark has been awarded.
oe	Or equivalent. Accept answers that are equivalent. eg accept 0.5 as well as $\frac{1}{2}$
[a, b]	Accept values between a and b inclusive.
[a, b)	Accept values $a \leq$ value $< b$
3.14 …	Accept answers which begin 3.14 eg 3.14, 3.142, 3.1416
Use of brackets	It is not necessary to see the bracketed work to award the marks.

Examiners should consistently apply the following principles

Diagrams

Diagrams that have working on them should be treated like normal responses. If a diagram has been written on but the correct response is within the answer space, the work within the answer space should be marked. Working on diagrams that contradicts work within the answer space is not to be considered as choice but as working, and is not, therefore, penalised.

Responses which appear to come from incorrect methods

Whenever there is doubt as to whether a student has used an incorrect method to obtain an answer, as a general principle, the benefit of doubt must be given to the student. In cases where there is no doubt that the answer has come from incorrect working then the student should be penalised.

Questions which ask students to show working

Instructions on marking will be given but usually marks are not awarded to students who show no working.

Questions which do not ask students to show working

As a general principle, a correct response is awarded full marks.

Misread or miscopy

Students often copy values from a question incorrectly. If the examiner thinks that the student has made a genuine misread, then only the accuracy marks (A or B marks), up to a maximum of 2 marks are penalised. The method marks can still be awarded.

Further work

Once the correct answer has been seen, further working may be ignored unless it goes on to contradict the correct answer.

Choice

When a choice of answers and/or methods is given, mark each attempt. If both methods are valid then M marks can be awarded but any incorrect answer or method would result in marks being lost.

Work not replaced

Erased or crossed out work that is still legible should be marked.

Work replaced

Erased or crossed out work that has been replaced is not awarded marks.

Premature approximation

Rounding off too early can lead to inaccuracy in the final answer. This should be penalised by 1 mark unless instructed otherwise.

Continental notation

Accept a comma used instead of a decimal point (for example, in measurements or currency), provided that it is clear to the examiner that the student intended it to be a decimal point.

Section A

Q	Answer	Mark	Comments
1	12	B1	

Q	Answer	Mark	Comments
2	–20, –16, –2, –1, 4, 7	B2	B1 one value omitted or out of place, but otherwise order correct or correct in descending order
	Additional Guidance		
	7, 4, –1, –2, –16, –20 (descending)		B1
	–20, –16, –1, –2, 4, 7 (–1 in wrong place)		B1
	–1, –2, –16, –20, 4, 7		B0

Q	Answer	Mark	Comments
3	180 – (76 + 59) or 180 – 135 or 121 – 76 or 104 – 59	M2	oe M1 59 marked as the opposite angle on diagram or 180 – 59 or 121 which may be marked as the adjacent angle to 59 on the diagram or 180 – (180 – 59) or 76 + 59 or 135 or 180 – 76 or 104 or (360 – 2 × 59) ÷ 2
	45	A1	

Q	Answer	Mark	Comments
4	**Alternative method 1**		
	330 – 250 or 80	M1	
	their 80 ÷ 250 (× 100) or 0.32	M1dep	oe eg 80 ÷ 2.5
	32	A1	
	Alternative method 2		
	330 ÷ 250 or 1.32 or 132	M1	
	their (1.32 – 1) (× 100) or 0.32 or their 1.32 × 100 – 100 or 132 – 100	M1dep	
	32	A1	
	Additional Guidance		
	For method marks with an incorrect or no answer, a build-up method must be complete		

Q	Answer	Mark	Comments
5	$5\pi + 10$ or [25.7, 25.71]	B3	B2 5π or $\pi \times 10 \div 2$ or [15.7, 15.71] or $10\pi + 10$ or [41.4, 41.42] or $2.5\pi + 10$ or [17.8, 17.9] B1 $k\pi + 10$ where k is a constant or 10π or [31.4, 31.42] or 2.5π or [7.8, 7.9]

Section B

Q	Answer	Mark	Comments
6(a)	**Alternative method 1**		
	$\frac{11}{40} \times 720$ or 198 or $\frac{7}{16} \times 720$ or 315 or $\frac{1}{5} \times 720$ or 144	M1	oe
	(their 198 + their 315 + their 144) ÷ 720 (× 100) or 657 ÷ 720 (× 100) or 0.9125 or 91.25 or 0.0875	M1dep	oe eg $\frac{\text{their 198}}{720} + \frac{\text{their 315}}{720} + \frac{\text{their 144}}{720}$ their 198, 315 and 144 must come from correct method or 0.275 + 0.4375 + 0.2(0) or 27.5 + 43.75 + 20
	8.75(%) or 0.0875 and 0.08	A1	

Mark scheme continues on the next page

6(a) cont.	**Alternative method 2**		
	$\frac{11}{40} \times 720$ or 198 or $\frac{7}{16} \times 720$ or 315 or $\frac{1}{5} \times 720$ or 144	M1	oe
	$\frac{720 - \text{their } 198 - \text{their } 315 - \text{their } 144}{720}$ or $\frac{63}{720}$ or $\frac{7}{80}$ or [0.0875, 0.09]	M1dep	oe their 198, 315 and 144 must come from correct method
	[0.0875, 0.09] and 0.08 or [8.75%, 9%]	A1	
	Alternative method 3		
	$\frac{11}{40} \times 720$ or 198 or $\frac{7}{16} \times 720$ or 315 or $\frac{1}{5} \times 720$ or 144	M1	oe implied by 63
	0.08×720 or 57.6 or 58	M1	oe
	63 and 57.6 or 63 and 58	A1	
	Alternative method 4		
	$\frac{11}{40} + \frac{7}{16} + \frac{1}{5}$ or $\frac{73}{80}$	M1	oe implied by 63
	0.08×720 or 57.6 or 58	M1dep	oe
	63 and 57.6 or 63 and 58	A1	

Mark scheme and Additional guidance continue on the next page

6(a) cont.	**Alternative method 5**		
	$\frac{11}{40} + \frac{7}{16} + \frac{1}{5}$ or $\frac{73}{80}$	M1	oe fraction
	their 73 ÷ their 80 or 0.9125 or 91.25 or 0.0875	M1dep	oe converting fraction to decimal
	[0.0875, 0.09] and 0.08 or [8.75%, 9%]	A1	
	Alternative method 6		
	$\frac{11}{40} \times 100$ or 27.5(%) or 0.275 or $\frac{7}{16} \times 100$ or 43.75(%) or 0.4375 or $\frac{1}{5} \times 100$ or 20(%) or 0.2	M1	
	their 27.5(%) + their 43.75(%) + their 20(%) or 91.25(%) or 0.9125 or 0.0875	M1dep	oe their 27.5(%), their 43.75(%) and their 20(%) must come from correct method
	[0.0875, 0.09] and 0.08 or [8.75%, 9%]	A1	
	Additional Guidance		
	Use the alt that favours the student		
	198 or 315 or 144 can be seen as a numerator over 720		

Q	Answer	Mark	Comments
6(b)	$1 - 0.55$ or 0.45	M1	oe fraction, decimal, percentage
	their $0.45 \div 3$ or 0.15	M1dep	oe fraction, decimal, percentage implied by 0.3
	their 0.15^2	M1	oe fraction, decimal, percentage their 0.15 must be greater than zero and less than one
	0.0225	A1	oe fraction, decimal, percentage SC3 0.09 SC1 0.3025
	Additional Guidance		
	eg $1 - 0.55 = 0.45$, $0.45 \div 2 = 0.225$, $0.225^2 = 0.051$		M1M0M1A0
	First mark could be implied, eg sum of probabilities for the zoo and museum being 0.45 oe fraction or percentage		
	SC3 is the probability for the zoo SC1 is the probability for the castle		

Q	Answer	Mark	Comments
6(c)	1.021 or 0.021 or 1.016 or 0.016 seen or implied	M1	implied by 3063 or 63 or 3048 or 48 or 3192
	3000×1.021^4 or [3259, 3260.1] or [259, 260.1]	M1	oe eg $3000 \times 1.021 \times 1.021 \times 1.021 \times 1.021$ or $3000\left(1+\frac{2.1}{100}\right)^4$
	$3000 \times 0.016 \times 4$ or 192	M1	implied by 3192
	their [3259, 3260.1] – 3000 – their 192 or their [259, 260.1] – their 192 or their 3192 + 65 or 3257 or their 192 + 65 or 257 or their [3259, 3260.1] – 65 or [3194, 3195.1] or their [259, 260.1] – 65 or [194, 195.1]	M1dep	oe dep on using simple and/or compound interest for both banks for four years
	[67, 68.1] or [3259, 3260.1] and 3257 or [259, 260.1] and 257 or [3194, 3195.1] and 3192 or [194, 195.1] and 192	A1	
	Additional Guidance		
	Values for complete build-up method as required for second M1 3063, 3127.32(3), 3192.99 or 3193, 3260(.0…)		
	Eg $3000 \times 1.021 \times 4 = 12252$, $3000 \times 1.016^4 = 3196.66$, $12252 - 65 = 12187$		M1M0M0M1depA0

Q	Answer	Mark	Comments
7(a)	14 ÷ 2 or 7 or 14 × 0.3 or 4.2 or 0.3 ÷ 2 or 0.15 or $14 \times \frac{0.3}{2}$	M1	
	2.1	A1	
	(their 2.1)^3 × 1.7 ÷ 12	M1	
	[1.3, 1.312]	A1ft	
	2400 × their [1.3, 1.312]	M1	
	[3120, 3149]	A1ft	ft their [1.3, 1.312]

<table>
<tr><th>Q</th><th>Answer</th><th>Mark</th><th>Comments</th></tr>
<tr><td rowspan="11">7(b)</td><td>160 × 0.4 or 64</td><td>M1</td><td>oe may be seen as Zulu total in table</td></tr>
<tr><td>160 – their 64 or 96</td><td>M1</td><td>oe
0.6 × 160 implies M2
may be seen as Yogi total in table</td></tr>
<tr><td>their 96 – 18 or 78</td><td>M1</td><td>may be seen as Yogi adult in table</td></tr>
<tr><td>their 78 – 20 or 58</td><td>M1</td><td>oe may be seen in Zulu adult in table
implied by 136 in adult total or 6 in Zulu child in table</td></tr>
<tr><td>(child total =) 24</td><td>A1</td><td>may be seen as child total in table</td></tr>
<tr><td>$\frac{24}{160}$ or $\frac{3}{20}$ or 0.15 or 15%</td><td>B1ft</td><td>ft their 24
oe fraction, decimal or percentage</td></tr>
<tr><td colspan="3">Additional Guidance</td></tr>
<tr><td colspan="2"><table>
<tr><th></th><th>Yogi</th><th>Zulu</th><th>Total</th></tr>
<tr><td>Child</td><td>18</td><td>6</td><td>24</td></tr>
<tr><td>Adult</td><td>78</td><td>58</td><td>136</td></tr>
<tr><td>Total</td><td>96</td><td>64</td><td>160</td></tr>
</table></td><td></td></tr>
<tr><td colspan="2">Ignore further simplification of fraction after $\frac{24}{160}$ seen</td><td></td></tr>
<tr><td colspan="2">Use the table and/or the working lines to award the best mark</td><td></td></tr>
<tr><td colspan="2">Values may be implied by subsequent values</td><td></td></tr>
<tr><td colspan="2">Allow rounding or truncating for B1ft mark</td><td></td></tr>
</table>

Q	Answer	Mark	Comments
8(a)	**Alternative method 1**		
	$26.2 \div 4$ or 6.55	M1	oe
	$26.2 \div 4 + \frac{15 \times 3}{60}$ or $26.2 \div 4 + 0.75$ or 7.3	M1	oe
	17.00 – 9.30 or 7.5	M1	oe
	7.3 and 7.5 and Yes	A1	oe
	Alternative method 2		
	$26.2 \div 4$ or 6 hours 33 mins	M1	oe
	their 6 hours 33 mins + 15 (mins) × 3 or 7 hours 18 mins	M1	
	5(pm) – 9.30(am) or 7 hours 30 mins	M1	oe
	7h 18 (mins) and 7 hours 30 (mins) and Yes	A1	oe
	Alternative method 3		
	$26.2 \div 4$ or 6 hours 33 mins	M1	
	9.30 + 15 (mins) × 3 or 10.15 or 9.30 + their 6 hours 33 mins or 4.03	M1	oe
	9.30 + their 6 hours 33 mins + 15 (mins) × 3 or their 10.15 + their 6 hours 33 mins or 16.48 or 4.48(pm)	M1dep	dep on M2
	4.48(pm) and Yes	A1	eg 16.48 and Yes

Mark scheme and Additional guidance continue on the next page

8(a) cont.	**Alternative method 4**		
	26.2 ÷ 4 or 6 hours 33 mins	M1	oe
	5.00 – 15 (mins) × 3 or 4.15	M1	oe
	their 4.15 – their 6 hours 33 mins or 9.42	M1dep	dep on M2
	9.42 and Yes	A1	
	Alternative method 5		
	26.2 ÷ 4 or 6 hours 33 mins	M1	oe
	5.00 – their 6 hours 33 mins or 10.27	M1dep	oe
	their 10.27 – 15 (mins) × 3 or 9.42	M1dep	
	9.42 and Yes	A1	
	Additional Guidance		
	Eg 6.55 + 0.45 = 7 4.30 and Yes		M1M0M0A0
	Eg 6.55 + 45 mins = 7.40 5.10 and No		M1M0M0A0
	Build-up method must be complete for first M1		

Q	Answer	Mark	Comments
8(b)	**Alternative method 1**		
	6, 8, 10, 12	M1	allow one error
	their 6 × 5001 + their 8 × 14 516 + their 10 × 8465 + their 12 × 2018 or 30 006 + 116 128 + 84 650 + 24 216 or 255 000	M1	condone their midpoints on or between the class boundaries
	their 255 000 ÷ 30 000 or 8.5	M1dep	dep on previous mark
	9.2 – their 8.5 or 0.7 or their 8.5 + 0.5 or 9	M1dep	oe dep on previous mark
	0.7 and Yes or 9 and Yes	A1	
	Alternative method 2		
	6, 8, 10, 12	M1	allow one error
	their 6 × 5001 + their 8 × 14 516 + their 10 × 8465 + their 12 × 2018 or 30 006 + 116 128 + 84 650 + 24 216 or 255 000	M1	condone their midpoints on or between the class boundaries
	9.2 – 0.5 or 8.7	M1	oe
	their 8.7 × 30 000 or 261 000	M1dep	dep on previous M1
	255 000 and 261 000 and Yes	A1	

Mark scheme continues on the next page

8(b) cont.	**Alternative method 3**		
	6, 8, 10, 12	M1	allow one error
	their 6 × 5001 + their 8 × 14 516 + their 10 × 8465 + their 12 × 2018 or 30 006 + 116 128 + 84 650 + 24 216 or 255 000	M1	condone their midpoints on or between the class boundaries
	9.2 – 0.5 or 8.7	M1	oe
	their 255 000 ÷ their 8.7 or 29 310.(…)	M1dep	dep on M2
	29 310.(…) and Yes	A1	

Q	Answer	Mark	Comments
8(c)	**Alternative method 1**		
	30 000 ÷ (11 + 1) or 2500 or 30 000 × $\frac{11}{11+1}$ or 27 500	M1	oe
	(30 000 – their 2500) × 38 or their 27 500 × 38 or 1 045 000	M1dep	
	1 045 000 and Yes	A1	
	Alternative method 2		
	1 000 000 ÷ 38 or [26 315, 26 316]	M1	
	30 000 × $\frac{11}{11+1}$ or 27 500	M1	oe
	[26 315, 26 316] and 27 500 and Yes	A1	
	Alternative method 3		
	1 000 000 ÷ 38 or [26 315, 26 316]	M1	
	their [26 315, 26 316] ÷ 11 × 12 or [28 707, 28 709]	M1dep	
	[28 707, 28 709] and Yes	A1	
	Additional Guidance		
	If 30 000 × 38 = 1 140 000 is completed first must continue to then ÷ 12 and × 11 to score M2. M1 cannot be awarded.		

Q	Answer	Mark	Comments
9(a)	$\pi \times \left(\frac{2.3}{2}\right)^2 \times 1.6$	M1	
	[6.64, 6.65]	A1	
	$\frac{\text{their}[6.64, 6.65] \times 1000 \times 4}{50}$	M3	oe M2 $\frac{\text{their}[6.64, 6.65] \times 4}{50}$ or [0.53, 0.532] oe or $\frac{\text{their}[6.64, 6.65] \times 1000}{50}$ or [132, 133] oe or their [6.64, 6.65] × 1000 × 4 or [26 560, 26 600] or $\frac{1000 \times 4}{50}$ or 80 M1 $\frac{\text{their}[6.64, 6.65]}{50}$ or [0.132, 0.133] oe or $\frac{1000}{50}$ or 20 or $\frac{4}{50}$ or 0.08 or $\frac{50}{4}$ or 12.5 or their [6.64, 6.65] × 1000 or [6640, 6650]
	[531, 532]	A1ft	ft their [6.64, 6.65]

Additional guidance continues on next page

	Additional Guidance	
	Ignore any subsequent attempt to convert into hours and minutes once [531, 532] seen	
	(their [6.64, 6.65] × 1000) ÷ (50 ÷ 4)	M3
	ft answers may be rounded up or down to nearest integer	

Q	Answer	Mark	Comments
9(b)	**Alternative method 1**		
	3 × 4.546 or 13.6(38)	M1	oe
	14	A1	
	their 14 × 8.49 or 118.86	M1	their 14 > 1 their 14 could be a product eg 3 × 4
	their 118.86 ÷ 6 or 19.81	M1dep	dep on previous M1 oe
	their 118.86 – their 19.81 or 99.05	M1dep	oe their 118.86 × $\frac{5}{6}$ implies M2
	99.05 and Yes	A1	

Mark scheme and Additional guidance continue on next page

9(b) cont.	**Alternative method 2**		
	3 × 4.546 or 13.6(38)	M1	oe
	14	A1	
	8.49 ÷ 6 or [1.41, 1.42]	M1	oe
	8.49 – their [1.41, 1.42] or [7.05, 7.1]	M1dep	dep on previous M1 oe 8.49 × $\frac{5}{6}$ implies M2
	their [7.05, 7.1] × their 14 or [98.7, 99.4] or 100 ÷ their [7.05, 7.1] or [14.08, 14.18]	M1dep	their 14 > 1
	[98.7, 99.4] and Yes or 14 and [14.08, 14.18] and Yes	A1	
	Additional Guidance		
	Eg 3 × 4.546 = 13.638, 13.638 × 8.49 = 115.79, 115.79 ÷ 6 = 19.30, 115.79 – 19.30 = 96.49 and Yes		M1A0M1M1depM1depA0
	their 14 could be 4.546 eg 8.49 × 4.546 = 38.59 eg 8.49 × 4.546 = 38.59, their 38.59 × 3 = 115.77		M0A0M1 M1A0M1
	For division by 6 accept × by 0.16 or better or 0.17		

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