



Pearson
Edexcel

Mark Scheme (Results)

Summer 2024

Pearson Edexcel Level 3 Certificate
In Mathematics in Context (7MC0) Paper 2

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Summer 2024

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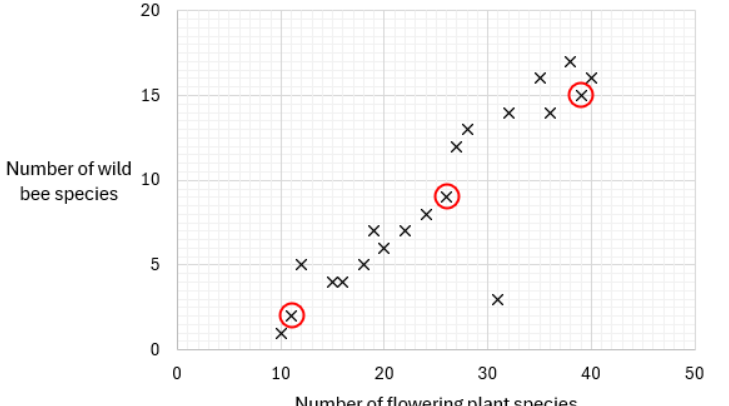
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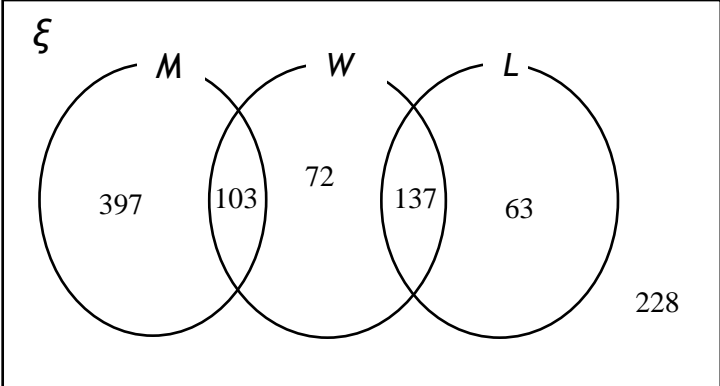
General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they 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.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Question	Working	Answer	Mark	Notes
1(a)	 <p>Number of wild bee species</p> <p>Number of flowering plant species</p>	Points plotted correctly	1	B1 all 3 points plotted correctly
1(b)		Description	1	C1 for valid description, eg positive correlation or as the number of flower species increases, the number of bee species also increases
1(c)(i)		31	1	B1 cao
1(c)(ii)		24 to 28	2	M1 for drawing a suitable line of best fit or for marking a point marked at $(x, 10)$, or a horizontal line drawn from $y = 10$ across to $(x, 10)$ where x is in the range 22 to 30 A1 for an answer in the range 24 to 28
1(c)(iii)		Reliable with reason	1	C1 for reliable with valid reason, eg Reliable as within the data range
1(d)	comment re co-dependency or describes how both variables could influence each other	Explanation	1	C1 for valid explanation, eg if flowering species increases so does the number of bees and if the number of bee species increases more flowers will be pollinated

Question	Working	Answer	Mark	Notes																						
2(i)	eg $A = \frac{5825 - 825}{5 - 1}$ or $2075 - 825 (= 1250)$ or $825 = A + B$ or $2075 = 2A + B$ eg $2075 - 825 (= 1250)$ and $825 = A + B$ or $825 = A + B$ and $2075 = 2A + B$	$A = 1250$ $B = -425$	4	M1 for setting up an equation that can be used to find a missing variable OR Forms one equation in A and B M1 for setting up equations/methods to be able to find both A and B M1 (dep 1 st M1) for substitution to find second variable A1 for $A = 1250$ and $B = -425$																						
2(ii)	eg $4000 + "425" = "1250"t$	3.54	2	M1 ft full method to find t with substitution of $d = 4000$ A1 ft for 3.54 oe																						
3	$80000 \times (1 - (20 \div 100))^{10}$ or by listing terms <table border="1" data-bbox="344 940 645 1294"> <tbody> <tr><td>2023</td><td>80000</td></tr> <tr><td>2024</td><td>64000</td></tr> <tr><td>2025</td><td>51200</td></tr> <tr><td>2026</td><td>40960</td></tr> <tr><td>2027</td><td>32768</td></tr> <tr><td>2028</td><td>26214.4</td></tr> <tr><td>2029</td><td>20971.52</td></tr> <tr><td>2030</td><td>16777.216</td></tr> <tr><td>2031</td><td>13421.7728</td></tr> <tr><td>2032</td><td>10737.41824</td></tr> <tr><td>2033</td><td>8589.934592</td></tr> </tbody> </table>	2023	80000	2024	64000	2025	51200	2026	40960	2027	32768	2028	26214.4	2029	20971.52	2030	16777.216	2031	13421.7728	2032	10737.41824	2033	8589.934592	8590	2	M1 for a full method, eg $80000 \times ("80" \div 100)^n$ where $n = 9, 10, \text{ or } 11$. A1 for accurate figure to compare, eg awrt 8600 clearly identified as population for 2033
2023	80000																									
2024	64000																									
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Question	Working	Answer	Mark	Notes
4	<p>Sell honey to farm shop: $0.5 \times 27 \times 12 = 162$ $0.36 \times 20 \times 12 = 86.4$ $0.14 \times 9 \times 12 = 15.12$ $162 + 86.4 + 15.12 + 70 (= 333.52)$</p> <p>Sell honey himself: e.g $0.5 \times 27 \times 15 = 202.5$ $0.36 \times 20 \times 15 = 108$ $0.14 \times 9 \times 15 = 18.9$ $202.5 + 108 + 18.9 (= 329.4)$</p>	Sell to the shop £333.52	5	<p>M1 for one correct calculation shown in method for calculating expected value of one option, eg $0.5 \times 27 \times 12 = 162$ or $0.5 \times 27 \times 15 = 202.5$</p> <p>M1 for complete method to find expected value by selling to farm shop or selling honey himself</p> <p>M1 for complete method to find expected value by selling to farm shop and selling honey himself</p> <p>A1 for Sell to farm shop = (£)333.52 and Sell honey himself = (£)329.4(0)</p> <p>C1ft (Dependent on M2). For sell honey to shop</p>
5(a)(i)		Explanation	1	C1 e.g. None of the male trout have a length of less than 40 cm or all males are at least 40 cm in length
5(a)(ii)		Description	1	C1 for valid description, eg male trout that have a weight greater than or equal to 1 kg
5(a)(iii)		<i>M U W U L'</i>	1	B1 for eg <i>M U W U L'</i>

Question	Working	Answer	Mark	Notes
5(b)		Correct values	4	B4 All regions correct (B3 4 or 5 regions correct) (B2 2 or 3 regions correct) (B1 1 region correct)
5(c)(i)	$\frac{"103" + "72" + "137"}{1000}$	$\frac{312}{1000}$	1	B1 ft for $\frac{"312"}{1000}$ oe
5(c)(ii)	$P(L \cap M')$ $P(L M') = P(L \cap M') / P(M')$ $= ((\text{"137"} + \text{"63"}) \div 1000) \div (500 \div 1000)$	0.4	2	M1 ft for $(\text{"137"} + \text{"63"}) \div 500$ or $((\text{"137"} + \text{"63"}) \div 1000) \div (500 \div 1000)$ A1 ft $\frac{2}{5}$ oe
5(c)(iii)		1	1	B1 1 cao

Question	Working	Answer	Mark	Notes
6(a)	$32 \div 40 = 0.8$ $85 \div 50 = 1.7$ $168 \div 80 = 2.1$ $245 \div 70 = 3.5$ $70 \div 50 = 1.4$ or proportionally equivalent values.	Histogram drawn	4	B4 for fully correct histogram (B3 for 4 correct blocks or for 5 correct frequency densities) (B2 for 3 correct blocks or for 3 or 4 correct frequency densities) (B1 for at least 2 correct blocks of different widths or for 2 correct frequency densities)
6(b)	eg $(3 \div 8 \times 168) + 245 + 70$ $600 - \left(\frac{5}{8} \times 168 + 85 + 32\right)$	0.63	2	M1 for $(3 \div 8 \times 168) + 245$ or $(3 \div 8 \times 168) + 70$ or for $\frac{5}{8} \times 168 + 85 + 32$ or for a method to use three intervals with at least 2 correct A1 $\frac{378}{600}$ or 0.63 oe
6(c)	eg $\frac{5}{8} \times 168 + \frac{3}{7} \times 245$	210 : 600	3	M1 for beginning to work with proportion, eg finding the number of fish between 180mm and 230mm or 230mm and 260mm M1 for a complete method to find number of fish between 180mm and 260mm using area or proportional method A1 for 210 : 600 oe

Question	Working	Answer	Mark	Notes																		
7(a)(i)		300	1	B1 cao																		
7(a)(ii)		Assumption	1	C1 for valid assumption, eg the number of bags given away increases by the same amount each year.																		
7(b)(i)	$6800 + (9 - 1) \times "300"$ or <table border="1" style="margin-left: 20px;"> <tbody> <tr><td>2011</td><td>6800</td></tr> <tr><td>2012</td><td>7100</td></tr> <tr><td>2013</td><td>7400</td></tr> <tr><td>2014</td><td>7700</td></tr> <tr><td>2015</td><td>8000</td></tr> <tr><td>2016</td><td>8300</td></tr> <tr><td>2017</td><td>8600</td></tr> <tr><td>2018</td><td>8900</td></tr> <tr><td>2019</td><td>9200</td></tr> </tbody> </table>	2011	6800	2012	7100	2013	7400	2014	7700	2015	8000	2016	8300	2017	8600	2018	8900	2019	9200	9200 million	2	M1 ft (a)(i) for a complete method to use formula, where $n = 7, 8$ or 9 A1 ft (a)(i) 9200 (million) oe
2011	6800																					
2012	7100																					
2013	7400																					
2014	7700																					
2015	8000																					
2016	8300																					
2017	8600																					
2018	8900																					
2019	9200																					
7(b)(ii)	eg $\frac{1}{2} \times 9 \times (2 \times 6800 + 8 \times "300")$ or $\frac{1}{2} \times 9 \times (6800 + "9200")$	72 000 million	2	M1 ft for $\frac{n}{2} \times (2 \times 6800 + (n - 1) \times "300")$, where $n = 8, 9$ or 10 or $\frac{n}{2} \times (6800 + "9200")$, where $n = 8, 9$ or 10 and n and "9200" are corresponding or attempt to sum the first 8, 9 or 10 terms in their arithmetic series A1 72 000 (million) oe																		

Question	Working	Answer	Mark	Notes
7(c)	$7700 \times 0.08 \times 0.05 (= 30.8)$ $7700 \times 0.08 \times 5 (= 3080)$	30.8 million	2	M1 for a complete method to find total income allow in pounds or pence A1 30.8 million oe
7(d)	eg $9800 \div 9 \times 7 (= 7622.22..)$ or $440 \div 9 \times 7 (= 342.22..)$ or $9800 - 440 (= 9360)$ or $9800 \times 6 (= 58800)$ or $440 \times 6 (= 2640)$ eg “7622.22..” $\times 6 (= 45733.33..)$ or “342.22..” $\times 6 (= 2053.33..)$ or “7622.22..” $-$ “342.22..” $(= 7280)$ or “9360” $\times 6 (= 56160)$ or “9360” $\div 9 \times 7 (= 7280)$ or “58800” $-$ “2640” $(= 56160)$ eg “45733.33..” $-$ “2053.33..” $(= 43680)$ or “56160” $\div 9 \times 7 (= 43680)$ or “7280” $\times 6 (= 43680)$	43.68 million	4	M1 for method to use 1 of: correct use of fraction or finding difference or using 6 grams M1 for method to use 2 of: correct use of fraction or finding difference or using 6 grams M1 for a complete method to find weight reduction allow in kg or g A1 awrt 44 million

Question	Working	Answer	Mark	Notes
8(i)	$2635 \times 6 (= 15810)$ or $5318 \times 28 (= 148904)$ or total of 164714 or 1857×6 $2635 \times 3 (= 7905)$ or $5318 \times 14 (= 74452)$	Shown	3	M1 for beginning to calculate with weight, eg $2635 \times 6 (= 15810)$ M1 for method to find weight for 2018 and weight of single-use bags for 2022, eg $2635 \times 6 + 5318 \times 28 (= 164714)$ and 1857×6 or for showing the target weight eg $(2635 \times 6 + 5318 \times 28) \div 2$ or for fully showing $11142 + 28n$?? 82357 where ?? can be = or an incorrect inequality C1 for inequality shown fully supported
8(ii)	$n \leq 71215 \div 28$	2543	2	M1 for full method to find n eg $n = (82537 - 11142) \div 28$ or $n = 2543.39\dots$ A1 cao
9	$87.2 \times 56.55 (= 4931.16)$ “8.72” $\times 56.55$ or “4931.16” $\div 10$	493.116 million	3	M1 for a valid first step, eg $87.2 \div 10 (= 8.72)$ M1 for a complete method to find the number of bags used in England A1 for awrt 493 million oe

Question	Working	Answer	Mark	Notes
10	$14x + 9y = 76.47$ and $20x + 8y = 81.12$ $180x + 72y = 730.08$ $\underline{112x + 72y = 611.76}$ $68x = 118.32$ or $280x + 180y = 1529.40$ $\underline{280x + 112y = 1135.68}$ $68y = 393.72$ $"1.74" \times 32 + "5.79" \times 13$	£130.95	6	B1 for setting up the correct equations M1 for correct method to eliminate one variable (condone one arithmetic error) M1 (dep M1 or B1) for a complete method to find the other variable, eg by substitution ft the value of the first variable or by elimination A1 for $x = 1.74$ and $y = 5.79$ M1 ft (dep 2 previous marks) for complete method to find the total cost of the required items using their clearly defined values for x and y A1 ft (dep adjacent method mark) for 130.95
11(a)(i)	milk $8x + 2y \leq 232$ enzyme $1.5x + 1.25y \leq 75$ milk $4x + y \leq 116$ enzyme $6x + 5y \leq 300$	Inequalities shown	3	M1 for using information to write one inequality for either milk or enzyme M1 for writing an inequality for milk and enzyme or one inequality fully simplified into required form C1 for simplification to correct form
11(a)(ii)		Explanation	1	C1 eg the number of hard cheese wheels made is less than or equal to 7 times the number of soft cheese wheels made

Question	Working	Answer	Mark	Notes
11(b)		$x \leq 35$ $y \leq 54$	2	B2 for both inequalities correct (B1 for one correct inequality or both inequalities written as an equation or with wrong inequality, eg $x = 35$ and $y = 54$ or $x \geq 35$ and $y \geq 54$)
11(c)	See diagram at end of mark scheme	Diagram drawn and feasible region identified	4	M1 for $4x + y = 116$ drawn M1 for $6x + 5y = 300$ drawn M1 for $x = 7y$ drawn A1 for a fully correct diagram with R labelled
11(d)	(5, 54) milk = $(5 \times 25 + 54 \times 18)$ (= 1097) (20, 36) milk = $(20 \times 25 + 36 \times 18)$ (= 1148) (28, 4) milk = $(28 \times 25 + 4 \times 18)$ (= 772)	£1148 and 20 hard cheese and 36 soft cheese	4	M1 ft for testing one of their vertices (not on an axis) in the FR or use of $25x + 18y$ M1 ft for testing a second vertex A1 ft accurate cost of milk for any valid vertex (not on an axis) A1 (20, 36) (£)1148

