



Pearson
Edexcel

Mark Scheme (Results)

Summer 2018

**Pearson Edexcel Mathematics in Context
Level 3 Core Maths (7MC0)**

Paper 01

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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)(i)		3.1 (years)	2	B1 oe
(ii)		7.8(086)%		B1 7.8-8(%)
(b)		Statements	2	C1 for a correct statement C1 a different correct statement Eg There are more elderly women than men The distribution differs between the ages of 20 and 25 The overall distribution shapes are very similar
2(i)	See table at end of Mark Scheme	7.1 and 3.9 and cumulative frequency totals	3	M1 for 7.1 or 3.9 M1 for at least 4 correct cumulative figures A1 for all figures
(ii)	See graph at end of Mark Scheme	Cumulative Frequency graph	3	M1 for use of appropriate linear scale for ages M1 for plotting at least 8 points (condone plotting consistently within the interval) A1 fully correct graph
(iii)		Statement	1	C1 Assumption re end point eg used 99 to follow interval pattern, did not plot last point as no end of interval, looked at data form pyramid and used '105' as end value
(iv)		16(%)	2	M1 ft $100 - '84'$ or $4.8 + 3.9 + 3.2 + 2.4 + 1.5 + 0.8$ (= 16.6) or e.g. $10.8 \div 2 + 7.1 + 3.9 + 0.8$ A1 ft 14-18(%)

Question	Working	Answer	Mark	Notes
3(a)	$3517000 \times 0.1 = 351700$ $3807000 \div 3 = 1269000$	351700 and 1256310 - 1269000	3	M1 for a complete method to find the number of children M1 for a complete method to find the number of adults A1 351700 and integer value in the range 1256310 -1269000
(b)		Statement	1	Statement eg No as there are a lot more adults overweight than children or
4	$2.1 \div 30 \times 100$	7 billion oe	2	M1 for a complete method to estimate 100% using 30% is 2.1 billion A1 7 billion oe
5		Statement	1	C1 Eg Do not know or No with reason e.g. as only percentages were given or Population of Iceland is much smaller than UK population so no
6	$18.5 \times 1.6^2 = 47.36$ $25.0 \times 1.6^2 = 64$	$47.36 \leq w < 64$ (kg)	3	M2 for 18.5×1.6^2 or 25.0×1.6^2 or 47.36 or 62.72-64 (M1 for substitution of 1.6 and either boundary into the formula) A1 $47.36 \leq w < 62.72-64$ NB accept use of 24.5-25.0 for maximum weight
7(i)	$1 - \frac{6 \sum d^2}{n(n^2 - 1)}$ $1 - \frac{6 \times 569.5}{14(195)}$ $1 - \frac{3417}{2730}$	- 0.25(1648..)	6	M1 method to rank GDP per capita (US \$) and % of population with BMI > 30 either way round but consistent M1 ft finds d for their rankings M1 ft for finding $\sum d^2$ for their ranking A1 for $\sum d^2 = 569.5$ M1 ft for using the spearman rank formula correctly for their figures A1 for SR = -0.25(1648..)

(ii)		Supported statement	1	C1 ft eg Reference to the change in strength of correlation and a reference that implies Norway is a potential outlier
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Question	Working	Answer	Mark	Notes						
8(a)		3	1	B1 cao						
(b)(i) (ii)		=B2*C2 =sum(D2:D11)	4	M1 for implying 25× 10 A1 for correct spreadsheet notation M1 for implying summation of D2 to D11 A1 for correct spreadsheet notation						
9(a)	$\bar{t} \equiv \frac{1673.355}{18} = 92.96416$ $\sqrt{\frac{158092.185}{18} - (92.96416)^2}$	1:32.964 11.855	3	B1 awrt 1:33 or awrt 93 secs M1 $\sqrt{\frac{158092.185}{18} - (92.96416)^2}$ A1 for 11.8 to 11.9						
(b)	<table border="1"> <thead> <tr> <th>Mean</th> <th>SD</th> </tr> </thead> <tbody> <tr> <td>2014 1:34.154</td> <td>12.288</td> </tr> <tr> <td>2015 1:32.96416</td> <td>11.855..</td> </tr> </tbody> </table>	Mean	SD	2014 1:34.154	12.288	2015 1:32.96416	11.855..	Comments	3	C1 ft for comparing any two figures (may be given as part of either C1 below) C1 ft for a comment about the means in context eg average time faster in 2015 C1 ft for a comment about the standard deviation in context eg lap times more consistent or less spread out in 2015
Mean	SD									
2014 1:34.154	12.288									
2015 1:32.96416	11.855..									

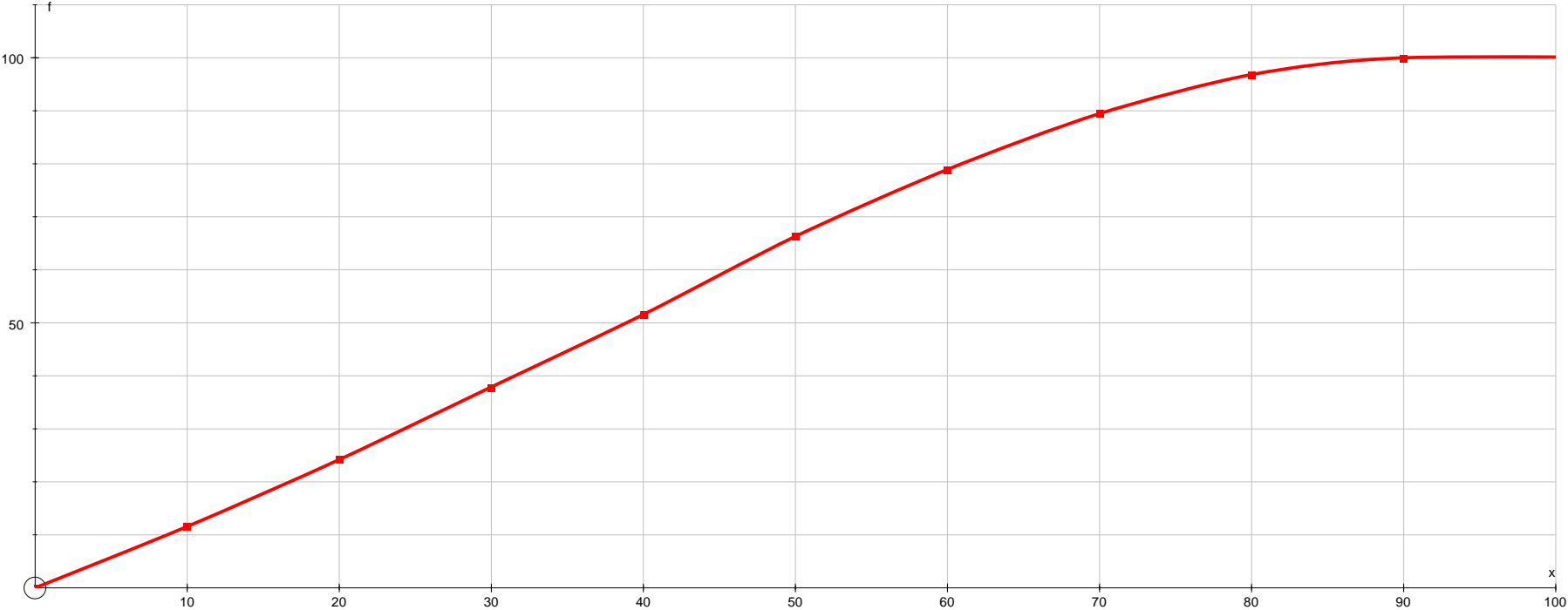
Question	Working	Answer	Mark	Notes
10(a)(i)	Median 1:28.601 IQR = 1.072 $87.796 - (1.5 \times 1.072) = 86.188$ $88.868 + (1.5 \times 1.072) = 90.476$	No outliers 1:26.188 oe 1:30.476 oe	3	M1 for method to find either the LQ (1:27.796) or UQ (1:28.868) may be indicated on the table M1 for a full method to calculate a boundary C1 for identification there are no outliers with correct figures
(ii)	Min 26.8 - 26.9 LQ 27.7 - 27.8 Med 28.6 UQ 28.8 - 28.9 Max 29.2	Graph drawn	3	M1 for method to find the median for Q2 (may be seen in part (i) or part (ii) or on diagram only) B2 ft for a fully correct box plot drawn and labelled (B1 for a partially correct box plot, allow up to 2 plotting errors)
(b)		Compare	2	C1 ft for a comment comparing medians e.g. Q2 has the median faster lap time median in Q2 is less than Q1 C1 ft for a comment comparing range or IQR e.g. Q2 has the greater spread of times because the IQR is greater For C2 at least one comparison must be in context
11(a)		Graph drawn	4	B1 appropriate linear scales on both axes M1 label with units on at least one axis M1 for plotting at least 4 points correctly A1 fully correct labelled diagram with units on both axes
(b)		80 – 83 oe Statement	2	B1 ft from graph C1 e.g. data (just) within given range or no because lap distance difficulty may alter

Question	Working	Answer	Mark	Notes
(c)	$S_{xt} = 136.266635$ $S_{xx} = 12.056158$ $S_{tt} = 2530.13188875$ $\frac{8831.576 - \left(\frac{93.534 \times 1673.355}{18} \right)}{\sqrt{\left(498.090 - \frac{(93.534)^2}{18} \right) \left(158092.185 - \frac{(1673.355)^2}{18} \right)}}$ $\frac{136.265635}{\sqrt{12.056158 \times 2530.131888}}$	0.7802...	3	M1 for a method to find one of S_{xx} , S_{xt} or S_{tt} or for finding $(\sum x^2 - \frac{(\sum x)^2}{n})(\sum y^2 - \frac{(\sum y)^2}{n})$ M1 for a complete method to find r A1 0.77- 0.79
(d)		Statement	2	C1 ft statement about type or strength of correlation C1 ft a relevant statement in context eg relationship between distance and time or same driving conditions on all circuits. Eg Strong positive correlation suggesting that laps are of similar difficulty

For Question 2i:

Age group (years)	Percentage of the population	Cumulative frequency
0-9	11.8	11.8
10-19	12.1	23.9
20-29	13.6	37.5
30-39	13.1	50.6
40-49	14.6	65.2
50-59	12.2	77.4
60-69	10.8	88.2
70-79	7.1	95.3
80-89	3.9	99.2
90+	0.8	100

For Question 2ii



Question 7

			ranked high to low			d	dsq
US	45674	27.5	2	1	1	1	
Greece	29268	18.1	10	2	8	64	
Estonia	19880	18	13	3	10	100	
Czech Rep	25530	17.1	12	4	8	64	
Canada	37808	15.9	4	5	-1	1	
Finland	35237	15.7	7	6	1	1	
Turkey	14243	15.2	14	7	7	49	
Begium	36308	13.8	6	8	-2	4	
Israel	27661	13.6	11	9	2	4	
France	33698	11.2	8	10	-2	4	
Netherlands	40813	11.1	3	11	-8	64	
Norway	55750	10	1	12.5	-11.5	132.25	
Sweden	36996	10	5	12.5	-7.5	56.25	
Italy	32408	9.9	9	14	-5	25	
569.5							

ranked 1 at highest

1.251648352

0.251648352

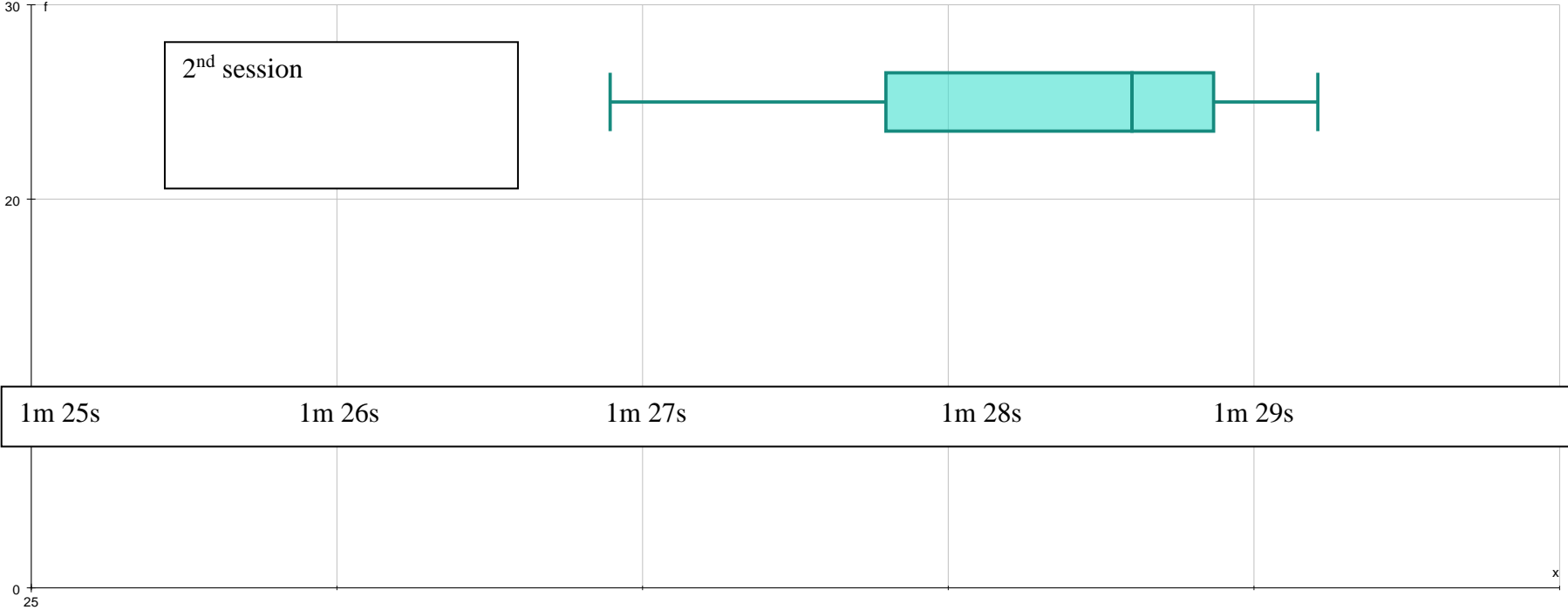
			ranked low to high			d	dsq
US	45674	27.5	13	14	-1	1	
Greece	29268	18.1	5	13	-8	64	
Estonia	19880	18	2	12	-10	100	
Czech Rep	25530	17.1	3	11	-8	64	
Canada	37808	15.9	11	10	1	1	
Finland	35237	15.7	8	9	-1	1	
Turkey	14243	15.2	1	8	-7	49	
Begium	36308	13.8	9	7	2	4	
Israel	27661	13.6	4	6	-2	4	
France	33698	11.2	7	5	2	4	
Netherlands	40813	11.1	12	4	8	64	
Norway	55750	10	14	2.5	11.5	132.25	
Sweden	36996	10	10	2.5	7.5	56.25	
Italy	32408	9.9	6	1	5	25	
569.5							

ranked 1 at lowest

1.251648352

0.251648352

Question 10



Question 11

