



NCFE Level 2 Functional Skills Qualification in Mathematics (603/5060/X)

Mark scheme: P002138 OS25

Assessment window: On demand

v1.3 Post-standardisation Refresher

Examiner Mark Scheme Guidance

Information

This guidance is intended to support NCFE examiners in the valid, reliable and consistent application of the relevant mark scheme version, against learner evidence generated during their external assessment.

This mark scheme provides:

- the total marks available for each question
- the subject content reference for each mark
- example process/methods and evidence of the types of responses expected for each mark
- (once confirmed) the pass mark for the relevant assessment version.

This mark scheme **must** be used for paper-based and online marking of the assessment version indicated.

Instructions and guidance on application

- All learners must receive the same treatment and should be marked fairly. Examiners must mark the first learner in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Learners must be rewarded for what they have shown they can do rather than penalised for things they have not done.
- Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Half marks must not be awarded.
- Examiners should be prepared to award zero marks if the learner's response is not worthy of credit according to the mark scheme.
- The mark scheme is a working document and may be added to at the standardisation to reflect valid alternative answers given by a learner.
- When in doubt regarding the application of the mark scheme to a learner's response, the Chief Examiner must be consulted.

This mark scheme provides the following information:

- section and activity information
- question number
- total marks available per question (top row, shaded) followed by
- attribution of individual marks per question
- problem solving (PS) and underpinning skill (UPS) attribution
- process/method or answers, as well as additional or alternative evidence; indicative of the subject content (SC) attribution
- any additional guidance, as required.

To support the valid, reliable and consistent marking of learner evidence, the following abbreviations are applied throughout the mark scheme:

Annotation	Explanation and use
FT	Follow through marks are applied when there are earlier arithmetic mistakes in the method.
OE	Or equivalent marks are available for the justification of the answer being presented in a different form to the mark scheme i.e. 0.5 or $\frac{1}{2}$.

CAO	Correct answer only.
Their	'Their' refers to the learners' own derived values.
Seen	Seen refers to the requirement to see the stated value in the learner's response or working out.
Imp	Implied refers to the learner's response implying correct working out used but not seen.
Brackets	Indicates units are not required on final answers or for answers seen within working.
BOD	Benefit of doubt where learner handwriting may be difficult to interpret but previous working may indicate correct final answer.
Shaded	Indicates requirements for full marks to be awarded.
Coloured SC box	On-screen only: indicates where SC ref will appear out of order in the Learning Outcomes marking screen

Version Control

Mark schemes are subject to version control. Examiners **must** ensure they have access to the latest version following each standardisation event.

Over time mark schemes will incorporate additional evidence captured and confirmed during standardisation events. Any additional evidence criteria will be captured in colour-coded text applicable to the dated standardisation event.

Recording of marks

Paper-based: Individual marks should be annotated in the 'Examiner' column in the learner script, added up and recorded at the end of each activity. The overall marks awarded for each learner should be clearly and legibly recorded in the grid on the front of the learner script.

Online: Onscreen marking tools (i.e. ticks, crosses) marks should be applied to indicate application throughout the learner script, in addition to marks being recorded numerically within the corresponding 'Learning Outcomes' box, indicated by the relevant Subject Content reference.

Annotation	Explanation and use
Tick	Used to indicate correct values/method or final answer.
Red highlight	Used to indicate where the learner has made an error in either the value used or an incorrect calculation.

Red line box	Used to indicate where the learner may have made an error that has resulted in benefit of doubt being applied i.e. transposition of figures but previous working clearly shows otherwise.
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Paper number: P002138 OS25			Version: 1.3	Pass mark: 35	
(Section A) Activity 1: Solar system			(Non-calculator Test)		
Q	Marks	UPS / PS	Process and Answer	Additional or Alternative Evidence (with guidance)	SC
1 (a)	1	UPS	5 900 000 000	CAO	N1a
1 (b)	3	PS	No AND 500 (seconds) OR No AND 30 000 (km/s) OR No AND 1 500 000 000 (km)	Award 3 marks if correct answer given from correct methods and accurate values if working seen	
	1		150 000 000 AND 300 000	CAO rounded values Only accept use of 200 000 000, 149 000 000, 149 500 000, 299 700 or 299 730 or 299 750	N2b
	1		Their 150 0(00 000) ÷ their 3(00 000) or 500 OR their 150 000 (000) ÷ 5(000) or 30 000 OR their 300 000 × 5000 or 1 500 000 000	OE Any correct method to work with average speed to find figures to compare FT Their rounded value or accurate value Only accept use of 200 000 000, 149 000 000, 149 500 000, 149 600 000 and 299 700, 299 730 or 299 729, 299 750	M15
	1		No AND 500 (seconds) OR No AND 30 000 (km/s) OR No AND 1 500 000 000 (km)	OE No supported by correct working FT Their 150 000 000 or their 300 000 Accept FT using the mark scheme values given for mark one only Accept FT using mark scheme values in 2nd mark if 1st mark not awarded Award 3 marks for No and 500 if no working seen	N2b
1 (c)	2	PS	3.84 (mpc)	Award 2 marks if correct answer given	
	1		3.8352	CAO 3.8352 from 0.752×5.1	N10b
	1		3.84 (mpc)	FT Their answer to 0.752×5.1 if seen only if their answer has 3 or more dp	N9b

1 (d)	4	PS	No AND -165 ($^{\circ}\text{C}$) or 165 ($^{\circ}\text{C}$) (colder on Pluto) OR No AND -230 ($^{\circ}\text{C}$ actual Pluto temp) and -340 ($^{\circ}\text{C}$ perceived Pluto temp) OR No AND 45 ($^{\circ}\text{C}$ perceived Mars temp) OR No AND $-96(.086\dots)$ ($^{\circ}\text{C}$ perceived Mars temp)	Award 4 marks if correct answer given from correct methods and accurate values if working seen	
	Alternative Method 1 – Ratio first, then negative numbers				
	1		$(-65 \div 13 (\times 46)$ or $(-5$ OR $46 \div 13$ or $3.53(846\dots)$ or 3.54	OE Any correct method to find the value of 1 share or 46 shares OR to work out scale factor	N11a
	1		$(-230$ ($^{\circ}\text{C}$)	CAO Accept $[229.45, 230.1]$ from use of $[3.53, 3.54]$ $(-230$ implies 1st mark	N11a
	1		Their $(-230) - (-65)$ or -165 OR $-65 - 275$ or -340 OR their $(-230) + 275$ or 45	OE Any correct method to work with temperature difference Accept $230 - 65$ or 165 OR $65 + 275$ or 340 or $230 - 275$ or -45 FT their values from use of $[229.45, 230.1]$ ± 165 or ± 45 implies 1st two marks	N2a
	1		No AND -165 ($^{\circ}\text{C}$) or 165 ($^{\circ}\text{C}$) (colder on Pluto) OR No AND -230 ($^{\circ}\text{C}$ actual Pluto temp) and -340 ($^{\circ}\text{C}$ perceived Pluto temp) OR No AND 45 ($^{\circ}\text{C}$ perceived Mars temp)	OE No supported by correct working FT their values from use of $[229.45, 230.1]$	N2a
	Alternative Method 2 – Reverse Process				
	1		$-65 - 275$ or -340	OE Any correct method to work with temperature difference	N2a
	1		Their $-340 \div 46 (\times 13)$ or $-7.39\dots$	OE Any correct method to apply ratio $-7.39\dots$ implies 1st mark	N11a
	1		$-96(.086\dots)$ ($^{\circ}\text{C}$ perceived Mars temp)	CAO $-96(.086\dots)$ implies 1st two mark	N11a
	1		No AND $-96(.086\dots)$ ($^{\circ}\text{C}$ perceived Mars temp)	OE No supported by correct working	N2a
1 (e)	2	PS	800 (hours)	Award 2 marks if correct answer given from correct methods and accurate values if working seen	
	1		$24 \div 0.03$	OE Any full correct method to find length of day on the moon	N6b
	1		800 (hours)	CAO	N6b
1 (f)	1	UPS	29% or 0.29 or $\frac{29}{100}$	OE fraction or decimal Must include %	H27

1 (g)	2	UPS	$3 \frac{263}{400}$ OR $\frac{1463}{400}$	Award 2 marks if correct answer given	
	1		$6 \frac{13}{400} - 2 \frac{150}{400}$ OR $\frac{2413}{400} - \frac{950}{400}$	OE any full correct method to subtract fractions Accept $4 - \frac{137}{400}$	N7a
	1		$3 \frac{263}{400}$ OR $\frac{1463}{400}$	CAO OE Accept 3.6575 or eg 1463 over 400 or 1463 out of 400	N7a

(Section B) Activity 2: Athletics club			(Calculator Test)		
Q	Marks	UPS / PS	Process and Answer	Additional or Alternative Evidence (with guidance)	SC
2 (a)	2	PS	72.54(°)	Award 2 marks if correct answer given from correct methods and accurate values if working seen	
	1		$(180 - 34.92) \div 2$ or 145.08	OE Any full correct method to find the size of A or 2A	M22a
	1		72.54(°)	CAO	M22a
2 (b)	6	PS	See below	Award 6 marks if correct answer given from correct methods and accurate values if working seen	
	Alternative method 1 – Working in metres				
	1		1.15	Uses conversion graph to find radius Accept radius in the range [1.1, 1.2]	M14b
	1		$(6.5 \times 5.5 -) 3.14 \times \text{their } 1.15^2$ or 4.15(265) or 31.59(735) (m ²)	OE Any correct method to find area of circle or area of rubber flooring in m ² Accept 1.15 sq OE seen instead of 1.15 ² FT Their radius from [1.1, 1.2] Accept [3.79, 4.522] or [31.22, 31.9506] from use of π and / or functional rounding [3.79, 4.522] or [31.22, 31.9506] implies 1st mark	M16b
	1		49.5, 52.25, 56.8, 57.2, 58.3, ... OR 65.9, 62.7, 58.3, 58.3, 57.2, ... OR $(57.2 + 58.3) \div 2$	OE Any full correct method to find median	H23a
	1		(£)57.75	CAO median	H23a
	1		Their 32 \times their 57.75 or 1848 OR 2000 \div their 57.75 or 34.6(320....) (m ²)	OE Any correct method to estimate total cost FT Their 32 from correctly rounding up their area value from correct methods FT Their 57.75 Accept any value [49.5, 65.9]	N9b
	1		Yes AND (£)1848 OR Yes AND 31(.597...) (m ²) and 34(.632...) (m ²)	OE Yes supported with correct working	M13a

Alternative method 2 – Working in feet [not expected at Level 2]

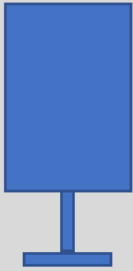
1		1.5 m = 5 feet or 1 m = 3.3 feet or 0.5 m = 1.6 feet	OE Uses conversion graph to find an equivalence between metres and feet Accept 1.5 m = [4.9, 5.1] feet 1 m = [3.2, 3.4] feet 0.5 m = [1.5, 1.7]	M14b
1		$((6.5 \times \text{their } 3.3) \times (5.5 \times \text{their } 3.3) -)$ 3.14 \times 3.8 ² or 45.34(16) or 343.97(59) (square feet)	OE Any correct method to find area of circle or area of rubber flooring in square feet Accept 3.8 sq OE seen instead of 3.8 ² FT Their metres to feet conversion factor from [3.2, 3.4] Accept [320.7, 368] from use of given ranges and use of π and / or functional rounding 343.97(59) implies 1st mark	M16b
1		49.5, 52.25, 56.8, 57.2, 58.3, ... OR 65.9, 62.7, 58.3, 58.3, 57.2, ... OR $(57.2 + 58.3) \div 2$	OE Any full correct method to find median	H23a
1		(£)57.75	CAO median	H23a
1		(Their 343.97(59) \div (their 3.3 ²) or 31.5(864...) (m ²) AND their 33 \times their 57.75 or 1848	OE Any correct method to estimate total cost FT Their 33 from correctly rounding up their area value from correct method and use of given ranges Accept 3.3 sq OE seen instead of 3.3 ² Accept use of [3.2, 3.4] from their 3.3 Accept use of [320.7, 368] for their 343.97(59) Accept [27.7, 35.94] rounded up to integer values [28, 36] (m ²) from use of above ranges FT their 57.75 Accept any value [49.5, 65.0] Accept use of known rates ie 1 m ² = approx. 10.76 ft ² or 1ft ² = approx. 0.09 m ² 57.75 OR 1848 implies 1st four marks	N9b
1		Yes AND (£)1848	OE Yes supported with correct working	M13a

2 (c)	2	PS	See below	Award 2 marks if correct diagram given	
	1		A rectangle drawn with one of : <ul style="list-style-type: none"> length 16 squares or width 1.5 squares positioned 5 squares away from running track 	Mark intention	M18b
	1		A rectangle with length 16 squares and width 1.5 squares and positioned 5 squares away from the running track	Award 2 marks for correctly drawn diagram	M18b
	Additional guidance eg				
<p style="text-align: center;">running track</p>					
2 (d)	1	UPS	Negative	CAO	H28
2 (e)	2	PS	7(.264) (kg) or 12(.114) (lb) AND weight is not within the region of reliability OR 7(.264) (kg) AND line of best fit predicts a negative length	Award 2 marks if correct comment and value given	
	1		16×0.454 or 7(.264) (kg) OR $5.5 \div 0.454$ or 12(.114) (lb)	OE Full method to convert from pounds to kg or largest kg value on graph to pounds	M14a
	1		eg 7(.264) (kg) or 12(.114) (lb) AND weight is not within the region of reliability OR 7(.264) (kg) AND line of best fit predicts a negative length	Valid explanation FT correct method of conversion FT Their line of best fit	H28
2 (f)	2	UPS	0.6(111) (%)	Award 2 marks if correct answer given from correct methods and accurate values if working seen	
	1		$550 \div 90\,000 \times 100$	OE Any full correct method to express 550 as a percentage of 90 000	N5b
	1		0.6(111) (%)	CAO Accept any correctly rounded figure from 0.611... seen	N5b

Activity 3: New business			(Calculator Test)		
Q	Marks	UPS / PS	Process and Answer	Additional or Alternative Evidence (with guidance)	SC
3 (a)	3	UPS	5.5	Award 3 marks if correct answer given from correct methods and accurate values if working seen	
	1		$5.544 \times 124 \div 125$	OE Any full correct method	N11a
	1		5.49(9648)	CAO Implies 1st mark	N11a
	1		5.5	FT Their 5.49(9648...) from correct method from using 5.544 only Award 3 marks if 5.5 seen without working	N9b
3 (b)	3	PS	No AND (£)5472(.906) or (£)5473 OR No AND (£)12 027(.094) OR No AND (£)6500 and (£)6527(.094)	Award 3 marks if correct answer given from correct methods and accurate values if working seen	
	1		6000×1.043^2 or $6527(.094)$	OE Any full correct method to find money in account after 2 years Accept 1.043^2 OE instead of 1.043^2	M13b
	1		12 000 – their 6527(.094) or 5472(.906) or 5473 OR 5500 + their 6527(.094) or 12 027(.094) OR 12 000 – 5500 or 6500	OE Any full correct method to find figures to compare FT Their 6527(.094) from correct method with compound interest 5472(.906) or 5473 or 12 027(.094) implies 1st mark	M13a
	1		No AND (£)5472(.906) or (£)5473 OR No AND (£)12 027(.094) OR No AND (£)6500 and (£)6527(.094)	OE Yes supported by correct working	M13b

3 (c)	5	PS	£4175.70	Award 5 marks if correct answer given from correct methods and accurate values if working seen	
	1		$(20^2 \times 30) \div 3 (\times 250)$	OE Correct method to substitute into formula Accept 20sq OE instead of 20^2	N3
	1		4000 OR 1 000 000 (cm ³)	CAO volume of one candle or 250 candles 4000 or 1 000 000 implies 1st mark	M17a
	1		4.49	CAO mode	H23b
	1		Their $4000 \div 100 \times 0.093$ (\times their 4.49) or 3.72 (kg of wax per candle) or (£)16.70(28) (cost of wax per candle) OR their $1\ 000\ 000 \div 100 \times 0.093$ (\times their 4.49) or 930 (total weight of candles, kg) OR their 4.49×0.093 (\times their $1\ 000\ 000 \div 100$) or (£)0.41(757) (cost per 100 cm ³ of wax)	FT their 4000 from correct method OE Any correct method to work out weight one candle or all candles or cost of wax for one candle or all, candle cost of 100 cm ³ of wax or cost of wax for one candle or all candles FT Their mode from [3.49, 5.21] Accept 0.41(757) rounded to 0.42 3.72 or 930 implies 1st two marks 16.70(28) implies 1st three marks 0.41(757) or 0.42 implies 3rd mark	N11a
	1		(£)4175.70	FT Their value from correct method to find volume of candles and work out cost FT their mode from [3.49, 5.21] Must have 2 dp 4175.5 from their 930×4.49 OE method 4175 from their 16.70(28) rounded to 16.70×250 4200 from their 0.41(757) rounded to $0.42 \times 1\ 000\ 000$	M13a

3 (d)	4	PS	Yes 70 AND 72 (boxes) OR Yes AND 5(.833...) and 6 (cm) OR Yes AND 1(.944...) and 2 (cm) Yes AND 28.8(%) Yes AND 0.288 and 0.28	Award 4 marks if correct answer given from correct methods and accurate values if working seen	
	Alternative method 1 – Comparing sizes of boxes				
	1		0.28 × 250 or 70	OE Any full method to work out percentage	N5a
	1		160 ÷ 25 or 6(.4) OR 80 ÷ 35 or 2(.28...)	OE Any correct method for one valid comparison of lengths Accept 160 ÷ 35 or 4(.57...) OR 80 ÷ 25 or 3(.2) for this mark only	M20
	1		6 × 6 × 2 or 72 OR 70 ÷ 2 ÷ 6 or 5(.833...) OR 70 ÷ 6 ÷ 6 or 1(.944...)	OE Any correct method to find figures to compare FT Their values correctly rounded down	N9b
	1		Yes AND 72 (boxes) OR Yes AND 5(.833...) and 6 (cm) OR Yes AND 1(.944...) and 2 (cm)	OE Yes supported by correct working	M20
	Alternative method 2 – Comparing Percentages				
	1		160 ÷ 25 or 6(.4) OR 80 ÷ 35 or 2(.28...)	OE Any correct method for one valid comparison of lengths Accept 160 ÷ 35 or 4(.57...) OR 80 ÷ 25 or 3(.2) for this mark only	M20
	1		6 × 6 × 2 or 72	OE Any correct method to find figures to compare FT Their values correctly rounded down	N9b
	1		Their 72 ÷ 250 (× 100) or 0.288	OE Any full method to work out percentage	N5a
	1		Yes AND 28.8(%) OR Yes AND 0.288 and 0.28	OE Yes supported by correct working	M20

Activity 4: Travel agent			(Calculator Test)		
Q	Marks	UPS / PS	Process and Answer	Additional or Alternative Evidence (with guidance)	SC
4 (a)	1	UPS		CAO Three rectangles with bottom rectangle narrower than top rectangle Mark intention.	M21
4 (b)	2	UPS	96.9(047...) (%)	Award 2 marks if correct answer given from correct methods and accurate values if working seen	
	1		$(8.4 - 0.26) \div 8.4 \times 100$ or 96.9(047...)	OE Any full method to find percentage discount	N6a
	1		96.9(047...) (%)	CAO Accept any correct rounding	N6a
4 (c)	4	PS	See below		
	Alternative method 1 – Estimate mean first				
	1		$(5 \times 18) + (15 \times 21) + (25 \times 8) + (35 \times 3)$ or $90 + 315 + 200 + 105$ or 710	OE Any correct method to find sum of midpoints multiplied by frequencies Allow one error in use of midpoints	H24
	1		14.2 (days in April)	CAO 14.2 implies 1st mark	H24
	1		9.41 \times 1.5 or 14.1(15) OR their 14.2 \div 1.5 or 9.46(666...) OR their 14.2 \div 9.41 or 1.509(0329) or [(their 14.2 – 9.41) \div 9.41] + 1 or 1.509(0329)	OE Any full correct method to find figures to compare Their 14.2 from correct method to work out estimated mean (allow one error in use of midpoints) Allow \div 4 14.1(15) or 9.46(666...) or 1.509(0329) implies 1st two marks	N11a
	1		Yes AND 14.2 and 14.1(15) OR Yes AND 9.46(666...) or 9.47 OR Yes AND 1.509(0329)	OE Yes supported by correct working FT Their decision with values from correct methods Allow one error in use of midpoints	N9a

Alternative method 2 – Use proportion first				
	1		Any pair of: 5 ÷ 1.5 or 3.3(333...) 15 ÷ 1.5 or 10 25 ÷ 1.5 or 16.6(666...) 35 ÷ 1.5 or 23.3(333...)	OE Any pair of midpoints divided by 1.5 N11a
	1		$[(5 \times 18) + (15 \times 21) + (25 \times 8) + (35 \times 3)] \div 1.5$ or $60 + 210 + 133.3(333...) + 70$ or $473.3(333...)$	OE Any full correct method to find sum of midpoints multiplied by frequencies then divided by 1.5 Allow one error in use of midpoints 473.3(333...) implies 1st mark H24
	1		9.46(666...) or 9.47	CAO 9.46(666...) implies 1st two marks H24
	1		Yes AND 9.46(666...) or 9.47	OE Yes supported by correct working FT Their decision with values from correct methods Allow one error in use of midpoints N9a
4 (d)	3	PS	0.8 hours or 48 minutes	Award 3 marks if correct answer given from correct methods and accurate values if working seen
	1		$51.2 \times 125\,000 (\div 100\,000)$ or $6\,400\,000$ (cm) or 64 (km)	OE Any correct method to apply scale M18a
	1		Their $64 \div 80 (\times 60)$ or 0.8	OE Any correct method to work out time in hours or minutes. Their 64 must come from use of /100,000 M15
	1		0.8 hours or 48 minutes	CAO must include units M15
4 (e)	2	UPS	0.21(111...)	Award 2 marks if correct answer given
	1		$\frac{19}{90}$	CAO H26
	1		0.21(111...)	FT Their fraction $\frac{a}{b}$ for $0 < \frac{a}{b} < 1$ and $b = 18, 21, 51, 39$ or 51 Accept rounded value to at least 2 dp H27
4 (f)	3	PS	See below	
4 (f) (i)	1		32	CAO for range H25
4 (f) (ii)	1		Valid comment to compare means eg the mean number of bookings is higher in the first 6 months of 2023	Comment must relate to data eg there were more bookings per month on average in 2023 Accept mean was bigger in 2023 H25
	1		Valid comment comparing range eg the bookings in the first 6 months were more spread in 2023	FT Their 32 from correct method seen Comment must relate to spread eg the number of bookings per month is more variable or the range is less consistent in 2023 Do not allow range is higher H25