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

Mark scheme: SAM
v1.0

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 alterative 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 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 ½.

CAO	Correct answer only.
Their	'Their' refers to the learners' own 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.

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

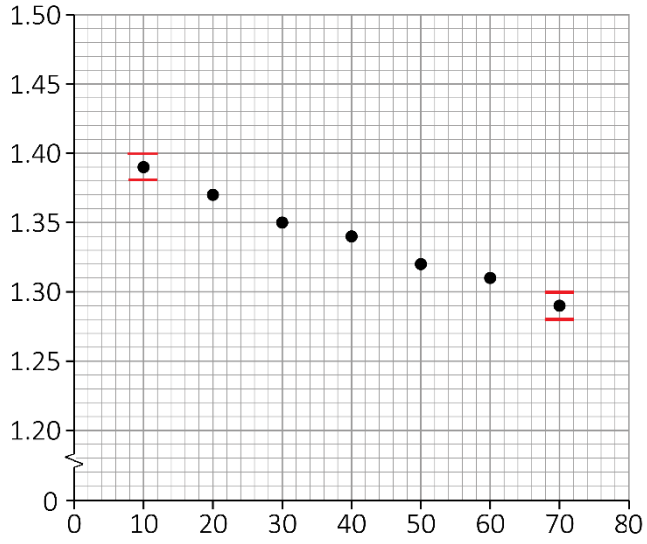
Paper-based: Individual marks should be annotated in the 'Examiner' column in the learner script, added up and recorded at the end of each activity. The overall marks awarded for each learner should be clearly and legibly recorded in the grid on the front of the learner script.

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.

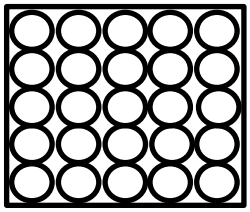
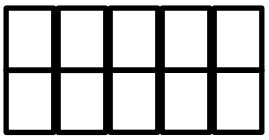
Annotation	Explanation and use
Tick	Used to indicate correct values/method or final answer.
Red highlight	Used to indicate where the learner has made an error in either the value used or an incorrect calculation.
Red line box	Used to indicate where the learner may have made an error that has resulted in benefit of doubt being applied i.e. transposition of figures but previous working clearly shows otherwise.

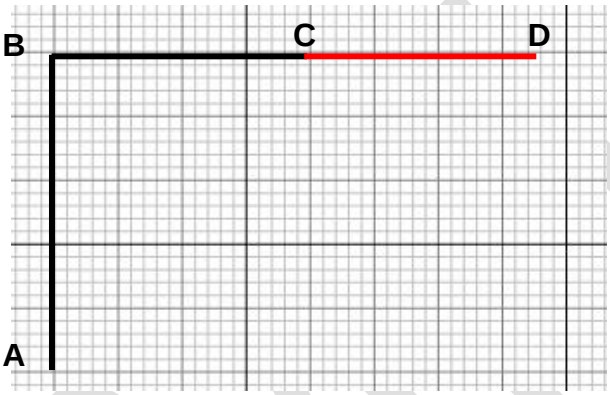
Paper number: Level 2 SAM				Version: 1.0	
(Section A) Activity 1: Flat share (Non-calculator Test)					
Q	**Marks**	**UPS / PS**	**Process and Answer**	**Additional or Alternative Evidence (with guidance)**	**SC**
1 (a)	**1**	**UPS**	40(%)	CAO	N5b
1 (b)	**3**	**UPS**	See below		
	1		375 389 395 433 450 475 330 368 412 425 447	Either set correctly ordered, ascending or descending	H25
	1		(Upton) (£)414		H25
	1		(Downton) (£)412		H25
1 (c)	**2**	**PS**	$\frac{13}{30}$	Award 2 marks if correct answer given	
	1		$\frac{17}{30}$		N7a
	1		$\frac{13}{30}$	CAO Implies first mark	N7a
1 (d)	**2**	**PS**	(£)5304 and yes	Award 2 marks if correct answer given	
	1		5200 × 1.02	Full method for finding 2% and adding to 5200	M13b
	1		(£)5304 and yes	Implies first mark even if yes missing	M13b
1 (e)	**4**	**PS**	Yes and £245	Award 4 marks if correct answer given	
	1		8.75 (m^2)	CAO area of rectangle	M16b
	1		3.5 (m^2)	CAO area of trapezium	M16b
	1		(Their 8.75 + their 3.5) or 12.25		M16b
	1		Their 12.25 × 20 and yes or no	FT their composite area	N11a
1 (f)	**3**	**PS**	See below		
	1		$\frac{18}{50}$	OE	N8
	1		0.33(…) and 0.36 or 33% and 36% or $\frac{50}{150}$ and $\frac{54}{150}$	Changes fractions to make comparison possible	N7b
	1		Option 1 from correct working		N7b

(Section B) Activity 2: Pollution (Calculator Test)					
Q	**Marks**	**UPS / PS**	**Process and Answer**	**Additional or Alternative Evidence (with guidance)**	**SC**
2 (a)	**1**	**UPS**	970215	CAO	N1a
2 (b)	**2**	**UPS**	815000 (days)	Award 2 marks if correct answer given	
	1		Their 970215 × 0.84 or 814 980.6	OE FT their 970 215	N5a
	1		815 000 (days)	FT their 814 980.6 > 100 000	N9b
2 (c)	**2**	**PS**	1 : 5000	Award 2 marks if correct answer given	
	1		1 (cm) : 0.05 (km) or 1 (cm) : 50 (m) or 7 (cm) : 35,000 (cm) or 7 (cm) : 350 (m)	No marks for 7 (cm) : 0.35 (km)	M18a
	1		1 : 5000	CAO	M18a
2 (d)	**1**	**UPS**	$\frac{3}{10}$	CAO	N8
2 (e)	**6**	**PS**	See below		
	Alternative method 1				
	1		(13 × 0.5) + (11 × 1.5) + (7 × 2.5) + (5 × 3.5) or 58		H24
	1		Their total distance ÷ 36 or 1.61 (km)	Mean distance per single journey	H24
	1		(their 1.61 × 2 × 164) or 528.08 (km)	Mean distance per student per year Accept range [528, 528.5]	N10b
	1		Use graph to estimate equivalent of 38 mpg = 13.5 (km/litre)	Accept answers in the range [13, 14] (km/litre)	M14b
	1		Their 528.08 ÷ 13.5 or 39.117 (litres)	Mean Litres per student. Allow if ×2 omitted earlier	M15
	1		Their 39.117 × 2.44 (g)	Mean NO_2 per student	M15
	Alternative method 2				
	1		(13 × 0.5) + (11 × 1.5) + (7 × 2.5) + (5 × 3.5) or 58		H24
	1		Their 58 × 2 × 164 or 19024 (km)	Total km per year	M15
	1		Use graph to estimate equivalent of 38 mpg = 13.5 (km/litre)	Accept answers in the range [13, 14] (km/litre)	M14b
	1		Their 19024 ÷ their 13.5 or 1409(….)	Total litres of fuel per year Allow if ×2 omitted earlier	M15
	1		Their 1409 × 2.44 or 3438	Total NO_2 per year	N10b

	1		Their 3438 ÷ 36	Mean NO_2 per student	H24
	Alternative method 3				
	1		(13 × 0.5) + (11 × 1.5) + (7 × 2.5) + (5 × 3.5) or 58		H24
	1		Their total distance ÷ 36 or 1.61 (km)	Mean distance per single journey	H24
	1		Use graph to estimate equivalent of 38 mpg = 13.5 (km/litre)	Accept answers in the range [13, 14] (km/litre)	M14b
	1		1.61 × 2 ÷ their 13.5 or 0.239	Mean daily litres per student	N10b
	1		Their 0.239 × 164 or 39.1(…)	Mean litres per year per student Allow if ×2 omitted earlier	M15
	1		Their 39.117 × 2.44	Mean NO_2 per student	M15
	Allow correct rounding at any stage.				
2 (f)	**3**	**PS**	$\left[\frac{1}{100}, \frac{5}{100}\right]$	Award 3 marks if answer in range	
	1		Scatter diagram completed with an appropriate line of best fit.	Line must go through (10, [1.38,1.4]) and (70, [1.28, 1.3])	H28
	1		(Value at $NO_2 = 55$) [1.30, 1.32] and (Value at $NO_2 = 35$) [1.33, 1.36]	If line of best fit attempted, FT their line. If no line attempted, values in range imply first mark.	H28
	1		$\left[\frac{1}{100}, \frac{5}{100}\right]$	FT their 1.34 – 1.31 expressed as a fraction	N4
	Additional guidance				
					

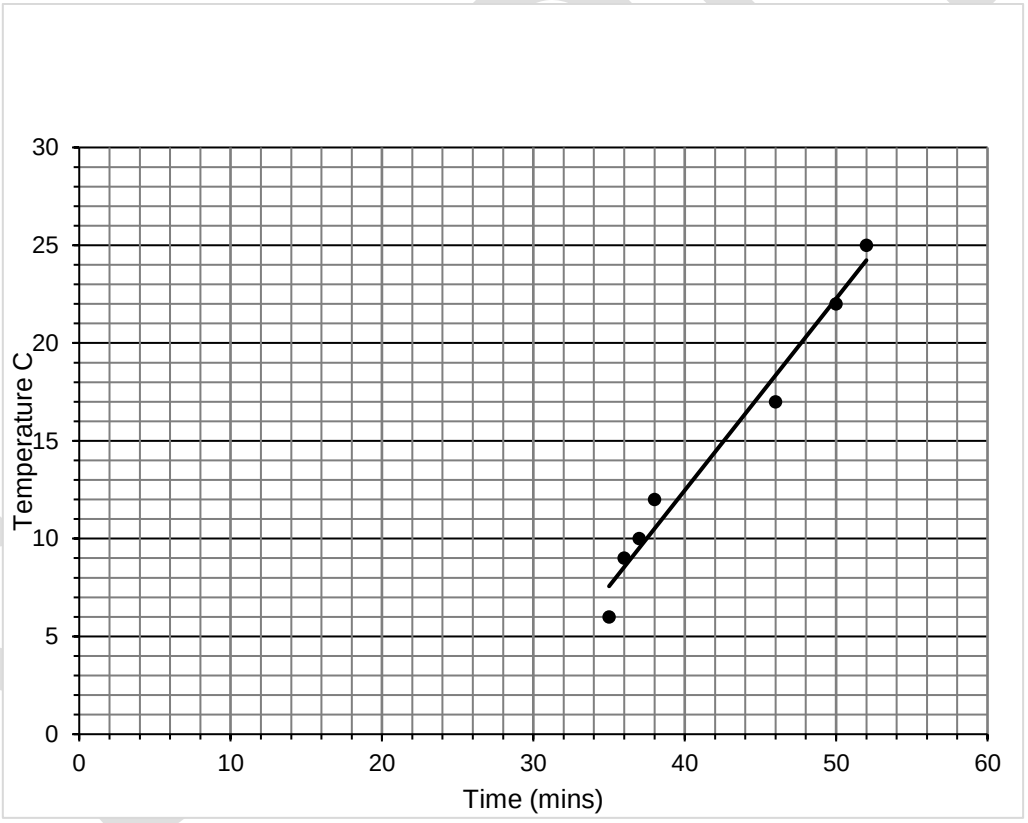
Activity 3: Boxes of chocolates (Calculator Test)					
Q	**Marks**	**UPS / PS**	**Process and Answer**	**Additional or Alternative Evidence (with guidance)**	**SC**
3 (a)	**2**	**PS**	See below		
	1		A 6 × 5 rectangle drawn and 2 coordinates correct.		M19
	1		Any rectangle drawn and their 4 coordinates correct written in (x,y) format	Correct sets of coordinates are (-2,3) (4,3) (4,-2) (-2,-2) or (-2,3) (-8,3) (-8,-2) (-2,-2) or (-2,3) (-7,3) (-7,-3) (-2,-3) or (-2,3) (3,3) (3,-3) (-2,-3)	M19
3 (b)	**2**	**UPS**	2089.67 (cm^3)	Award 2 marks if correct answer given	
	1		$(\pi r^2 h) = 3.14 \times 5.5 \times 5.5 \times 22$		M17a
	1		2089.67 (cm^3) Accept 2090 or 2089.7	Accept answer of 2090.73 (cm^3) from π use, accept accurate rounding to any dp or 2091	M17a
3 (c)	**4**	**PS**	9(%)	Award 4 marks if correct answer given	
	1		288.12 (g)	CAO	N5a
	1		(fraction less than 288.12 g =) $\frac{3}{10}$ or 0.3	FT on their 288.12 (g)	N9a
	1		$\frac{3}{10} \times \frac{3}{10}$ or 0.3 × 0.3 or $\frac{9}{10}$ or 0.09	FT on their $\frac{3}{10}$	H26
	1		9(%)	FT their $\frac{3}{10}$ or 0.3	H27
3 (d)	**1**	**UPS**	Table completed correctly	**Weight of box (g)** / **+/- Difference (g)** 294.04 / +0.04 293.71 / -0.29 292.59 / -1.41	N1b
3 (e)	**2**	**PS**	9 fudge chocolates, so Kate is not correct	Award 2 marks, supported by calculations	
	1		6:9:9:3 seen or 3 × 3 seen or 27 ÷ 9 = 3 seen	OE representations e.g. compare 3/9 with 8/27	N11a
	1		9 fudge chocolates, so Kate is not correct		N11a
3 (f)	**1**	**UPS**	1494 (boxes of chocolates)	CAO	H23b

3 (g)	**3**	**PS**	See below		
	1		(i) 50 (chocolate boxes)	CAO	M20
	1		(ii) Plan view: 	Sketches do not have to be to scale FT their maximum. Both drawings must match their value.	M21
	1		Elevation: 	FT their maximum. Both drawings must match their value.	M21

Activity 4: Training for a race (Calculator Test)					
Q	**Marks**	**UPS / PS**	**Process and Answer**	**Additional or Alternative Evidence (with guidance)**	**SC**
4 (a)	**3**	**PS**		Award 3 marks if D is accurately shown on the plan	
	1		A-C + (9 cm × 40 000) = 360 000 (cm) or 3600 (m) or 3.6 (km)	OE	M18a
	1		1.4 (km) / 0.4 (km) = 3.5 (cm / squares) or 1400 (m) / 400 (m) = 3.5 (cm / squares) or 140 000 / 40 000 = 3.5 (cm / squares)	FT on their 360 000 (cm)	M18b
	1		Point D correctly placed 3.5 cm / squares from C:  	FT on their 3.5 (cm / squares)	M18b
4 (b)	**2**	**UPS**	42.86 (minutes)	Award 2 marks if correct answer given	
	1		45 ÷ 1.05	OE	N6b
	1		42.86 (minutes) (to 2dp)	CAO	N6b
4 (c)	**2**	**UPS**	See below		
	1		Axes drawn with appropriate and consistent scales.		H28
	1		Data points correctly placed	Award mark even if no trend line has been drawn (See worked example)	H28
4 (d)	**4**	**PS**	See below		
	1		Uses graph in 4 (c) to estimate the time to run 5 km at 15°C, approx. 43 minutes (accept 42 - 44 minutes)	FT accept answers if consistent with an incorrectly drawn scatter diagram.	H28
	1		(13.1 × 1.6) = 20.96 (km)	CAO	M14a
	1		(20.96 ÷ 5) × 1.12 × 43	FT their reading from diagram FT their 20.96 (km)	N3
	1		201.89 (minutes) or permit within range of 197.19 to 206.58 (minutes)	FT their reading from diagram FT their 20.96 (km)	N3

4 (e)	**2**	**PS**	280 (m)	Award 2 marks if correct answer given	
	1		15000 ÷ 320 or 46.875 (laps)		N2a
	1		280 (m)	CAO	N10b
4 (f)	**2**	**PS**	288 (°)	Award 2 marks if correct answer given	
	1	PS	0.8 × 360	OE	N11a
	1	PS	288 (°)		M22a

4 (c): Graph (or reverse axes):



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