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

Mark scheme: P001259

Assessment window: Monday 9 December 2019 – Friday 13 December 2019

v1.1

past paper

# 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 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.

<b>CAO</b>	Correct answer only.
<b>Their</b>	'Their' refers to the learners' own values.
<b>Seen</b>	Seen refers to the requirement to see the stated value in the learner's response or working out.
<b>Imp</b>	Implied refers to the learner's response implying correct working out used but not seen.
<b>Brackets</b>	Indicates units are not required on final answers or for answers seen within working.
<b>BOD</b>	Benefit of doubt where learner handwriting may be difficult to interpret but previous working may indicate correct final answer.
<b>Shaded</b>	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.

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

**Note:** Pass marks for Functional Skills external assessments are set in an awarding meeting, in which a combination of statistical analysis and professional judgement is used to determine the minimum required standard to achieve a pass in the assessment.

While different versions of the same assessment are designed to be of the same level of difficulty, variations in content can lead to the minimum required standard being represented by different marks across versions.

past paper

Paper number:		L2_P001259 paper-based 2		Version:	1.1	Pass mark:	38
(Section A) Activity 1: Weather (Non-calculator Test)							
Q	Marks	UPS / PS	Process and Answer	Additional or Alternative Evidence (with guidance)		SC	
1 (a)	1	UPS	2014 and 23.7 and 23.6			N1b	
1 (b)	1	UPS	8.22(%)			N9b	
1 (c)	2	PS	35 (°C) or 91.22 (°F) AND no or valid comment, e.g. incorrect	Award 2 marks if correct answer given			
	1		5 × (95 – 32) ÷ 9 or 35 or 32.9 = 5 × (°F – 32) ÷ 9 or 91.22	Allow any representation for °F		N3	
	1		35 (°C) or 91.22 (°F) AND no or valid comment, e.g. incorrect	CAO Allow rounding to 91 or 91.2		N12	
1 (d)	2	PS	18 (°C) and 19 (°C)	Award 2 marks if correct answer given			
	1		18 (°C)	Either order acceptable		H23a	
	1		19 (°C)			H23b	
1 (e)	3	PS	See below				
	1		$\frac{70}{130}$	OE		H26	
	1		$\frac{16}{52}$	OE		H26	
	1		$\frac{7}{13}$ and $\frac{4}{13}$ and rain	CAO Allow any valid comparison Allow percentage or decimal		H27	
1 (f)	3	PS	See below				
	1		5 or 4	Accept 4 if clearly identified as days inaccurate May be seen as numerator of fraction		H28	
	1		$\frac{5}{9}$	Accept $\frac{4}{9}$ if clearly identified as fraction inaccurate		N8	
	1		55(.5...) (%) and yes	Accept 44(.4...)(%) and yes Accept if converted 70% to $\frac{7}{10}$ or FT their 5 correctly calculated e.g. $\frac{4}{8} = 50\%$		N4	
1 (g)	3	PS	See below				

<b>Alternative method 1</b>				
1		12 : 3 000 000 or 16 : 4 800 000	OE	M18b
1		1 : 250 000 and 1 : 300 000	OE Implies 1 <sup>st</sup> mark	M18b
1		3 (km)	CAO	M18b
<b>Alternative method 2</b>				
1		1 cm : 30 ÷ 12 km or 1 cm : 48 ÷ 16 km	OE Accept "equals" or "=" used instead of ":"	M18b
1		1 cm : 2.5 km and 1 cm : 3 km OR 30 ÷ 3 AND 48 ÷ 3	OE Implies 1 <sup>st</sup> mark	M18b
1		3 (km)	CAO	M18b

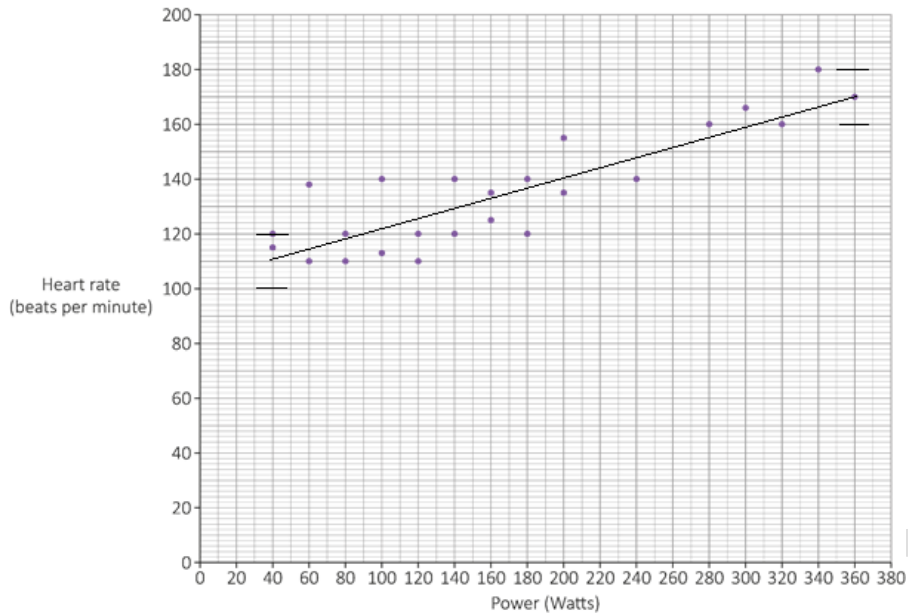
<b>(Section B) Activity 2:</b>		<b>Running a business</b>		<b>(Calculator Test)</b>	
<b>Q</b>	<b>Marks</b>	<b>UPS / PS</b>	<b>Process and Answer</b>	<b>Additional or Alternative Evidence (with guidance)</b>	<b>SC</b>
<b>2 (a)</b>	<b>4</b>	<b>PS</b>	(£)[170.60, 170.64]	Award 4 marks if answer in range	
	1		$3.14 \times 3.5 \times 3.5$ or [38.465, 38.5]	Use of $\pi$ gives 38.4845...	M16b
	1		$(3.14 \times 3.5 \times 3.5) \div 4$ OR $38.465 \div 4 = [9.6, 9.625]$	FT attempt at calculation of area of a circle	M16b
	1		40.14 or 40.15 (m <sup>2</sup> )	CAO Finds total area Implies first 2 marks	M16b
	1		(£)[170.59, 170.64]	FT their $40.14 \times 4.25$ with correct answer	M13a
<b>2 (b)</b>	<b>2</b>	<b>UPS</b>	(£)208.33	Award 2 marks if correct answer given	
	1		$250 \div 1.2(0)$	Accept any full correct method.	N6b
	1		(£)208.33		N6b
<b>2 (c)</b>	<b>3</b>	<b>PS</b>	See below		
	<b>Alternative method 1 (working in ml)</b>				

	1		$20 \times 63.2$ or 1264	ml of weed killer needed Award if rounded value of 64 used but not 63	M15
	1		Their $1264 + (\text{their } 1264 \times 10)$ or $1264 + 12640$ or 13904	ml spray needed FT their 1264 from a multiplication calculation	N11a
	1		2.78 or 2.8 or 3	CAO 3 on its own seen without working, award 1 mark only	N11a
<b>Alternative method 2 (working in litres)</b>					
	1		$20 \times 63.2 \div 1000$ or 1.264	litres of weed killer required Award if rounded value of 64 but not 63	M15
	1		Their $1.264 + (\text{their } 1.264 \times 10)$ or $12.640 = 1.264$ or 13.904	litres of spray needed FT their 1.264 following correct calculation	N11a
	1		2.78 or 2.8 or 3	CAO	N11a
<b>2 (d)</b>	<b>5</b>	<b>PS</b>	609 (patios)	Award 5 marks if correct answer given	
<b>Alternative method 1 (hours)</b>					
	1		$7 \times 5 \times 26$ or 910	Time available (hours)	N2a
	1		$(45 \times 25) + (75 \times 36) + (105 \times 45) + (135 \times 21)$ or $1125 + 2700 + 4725 + 2835$ or 11385 (mins) or 189.75 (hours)	Accept consistent use of upper or lower bounds	H24
	1		$(189.75 \div 127) = 1.49(\dots)$ or 1.5	CAO mean hours per job	H24
	1		Their $910 \div \text{their } 1.5$ or [606, 611]	FT from division by 127 with consistent use of midpoints or upper or lower bounds	M15
	1		609 (patios)	FT their [606, 611] rounded up or down to a whole number	M15
<b>Alternative method 2 (minutes)</b>					
	1		$7 \times 5 \times 26 \times 60$ or 54600	time available (mins)	N11a
	1		$(45 \times 25) + (75 \times 36) + (105 \times 45) + (135 \times 21)$ or $1125 + 2700 + 4725 + 2835$ or 11385 (mins)	Accept consistent use of upper or lower bounds	H24

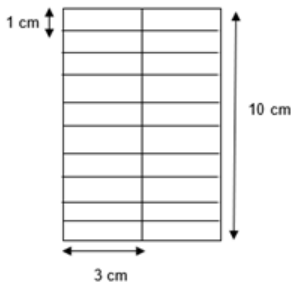
	1		Their $11385 \div (25 + 36 + 45 + 21)$ or their $11385 \div 127$ or 89.6(...) or 90	CAO mean mins per job	H24
	1		Their $54600 \div$ their 90 or [606, 611]	FT from division by 127	M15
	1		609 (patios)	FT their [606, 611] rounded up or down to a whole number Accept rounding to nearest 10	M15
<b>2 (e)</b>	<b>1</b>	<b>UPS</b>	$\frac{46}{82}$ or $\frac{23}{41}$ or 0.56 or 56%		H27

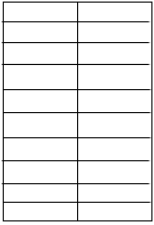
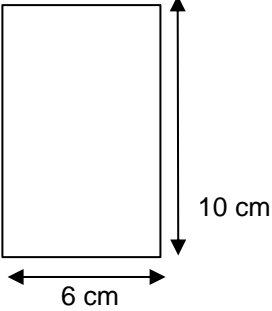
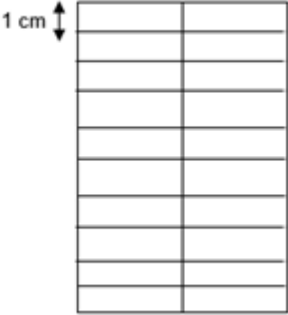
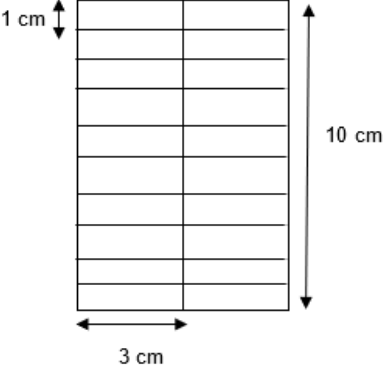
<b>Activity 3: Cycling (Calculator Test)</b>					
<b>Q</b>	<b>Marks</b>	<b>UPS / PS</b>	<b>Process and Answer</b>	<b>Additional or Alternative Evidence (with guidance)</b>	<b>SC</b>
<b>3 (a)</b>	<b>1</b>	<b>UPS</b>	$\frac{41}{102}$	OE Do not accept $\frac{20.5}{51}$	N8
<b>3 (b)</b>	<b>2</b>	<b>UPS</b>	See below		
	1		$\frac{6}{100}$ or $\frac{3}{50}$	OE	N4
	1		6(%)	CAO	N4
<b>3 (c)</b>	<b>6</b>	<b>PS</b>	See below		
	1		$191.5 - (0.007 \times 25 \times 25)$ or $191.5 - 4.375$		N3
	1		187(.125)	Implies first mark	N12
	1		$(72 \div 100) \times$ their 187 or 134 or 135	OE FT from correct method in 1st mark	N5a
	1		Scatter diagram completed with an appropriate line of best fit	If line incomplete award if line <b>would</b> go through (40, [100,120]) and (360, [160, 180]) when continued	H28
	1		(Watts when HR = 135) = [160, 185]	If line of best fit attempted, FT their line If no line attempted, values in range imply previous mark	H28
	1		[560, 650]	CAO	M15

**Additional guidance**



<b>3 (d)</b>	<b>4</b>	<b>PS</b>	See below		
	<b>Alternative method 1</b>				
	1		23.1	CAO	H25
	1		20.9	CAO	H25
	1		(their 23.1 – their 20.9) ÷ their 23.1	OE FT their means	N6a
	1		9.5(...) or 9.6 or 10 and no	FT their 23.1 and 20.9 [9.5 – 10] seen implies 3 <sup>rd</sup> mark	N6a
	<b>Alternative method 2</b>				
	1		23.1	CAO	H25
	1		20.9	CAO	H25
	1		Their 23.1 × 0.89 or 20.559 or 20.6	OE FT their means from correct method	N6a
1		20.6 and no	FT their 23.1 and 20.9	N6a	
<b>3 (e)</b>	<b>2</b>	<b>UPS</b>	See below		
	1	<b>(i)</b>	20 (km)		M14a
	1	<b>(ii)</b>	$\frac{20}{23}$	FT their 20 < 23	M14a

Activity 4: Packaging (Calculator Test)					
Q	Marks	UPS / PS	Process and Answer	Additional or Alternative Evidence (with guidance)	SC
4 (a)	2	PS	5 (biscuits)	Award 2 marks if correct answer given	
	1		$(108 \div 135) \times 25$ or $108 \div (135 \div 25)$ or 20	OE Any full correct method	N11a
	1		5 (biscuits)	CAO	N11a
4 (b)	4	PS	5.3(...) or 2125(...) AND yes	Award 4 marks if correct answer given	
	1		$3.14 \times 19 \times 19 \times 2$ or $2267(.08)$ or $3.14 \times 9.5 \times 9.5 \times 1.5$ or $425(.0775)$		M17a
	1		$2267(.08)$ and $425(.0775)$	CAO	M17a
	1		Their $2267(.08) \div$ their $425(.0775)$ or $5 \times$ their $425(.0775)$ or $5(.3)$ or $2125(...)$	FT must be from attempt at calculation of the volume of a circle	N8
	1		5.3(...) or 2125(...) AND yes	CAO	N1b
4 (c)	5	PS	12.878(...) or 13(%)	Award 5 marks if correct answer given	
	1		$(40 \times 40 \times 2) + (40 \times 2.5 \times 9)$ Or $(38 \times 38 \times 2) + (38 \times 2 \times 9)$	Any full correct method for surface area of box	M17b
	1		4100 (cm <sup>2</sup> )	Implies first mark	M17b
	1		3572 (cm <sup>2</sup> )	Implies first mark	M17b
	1		(their 4100 – their 3572) $\times$ 100 $\div$ their 4100	OE any full correct method SC: use of 4000 and 2888 award 1 mark	N5b
	1		12.878(...) or 13(%)	CAO Accept any correct rounding	N5b
4 (d)	3	UPS		Award 3 marks if correct answer given Does not need to be drawn accurately	

	1		 <p>or</p> 	<p>OE</p> <p>Accept if rectangle split into strips with 10 or 6 seen</p>	M21
	1			<p>Accept if indicated rectangle with centre line and dimensions included i.e. 6 cm and 10 cm for both full measurements</p> <p>OR</p> <p>10 cm and 3 cm for half width</p>	M21
	1			<p>OE</p> <p>Accept if full width (6 cm) indicated instead of half width (3 cm)</p>	M21
<b>4 (e)</b>	<b>1</b>	<b>UPS</b>	<b>80 (°)</b>		<b>M22a</b>



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