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

Mark scheme:     Practice paper OS15
v1.7 Post refresher standardisation 30.3.2022

# 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 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 ½. |
| **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. |

| Paper number: | L2 P001601 onscreen P15 | | | Version: | 1.7 | Pass mark: 36 |

**(Section A) Activity 1:**   Saving energy   (Non-calculator Test)

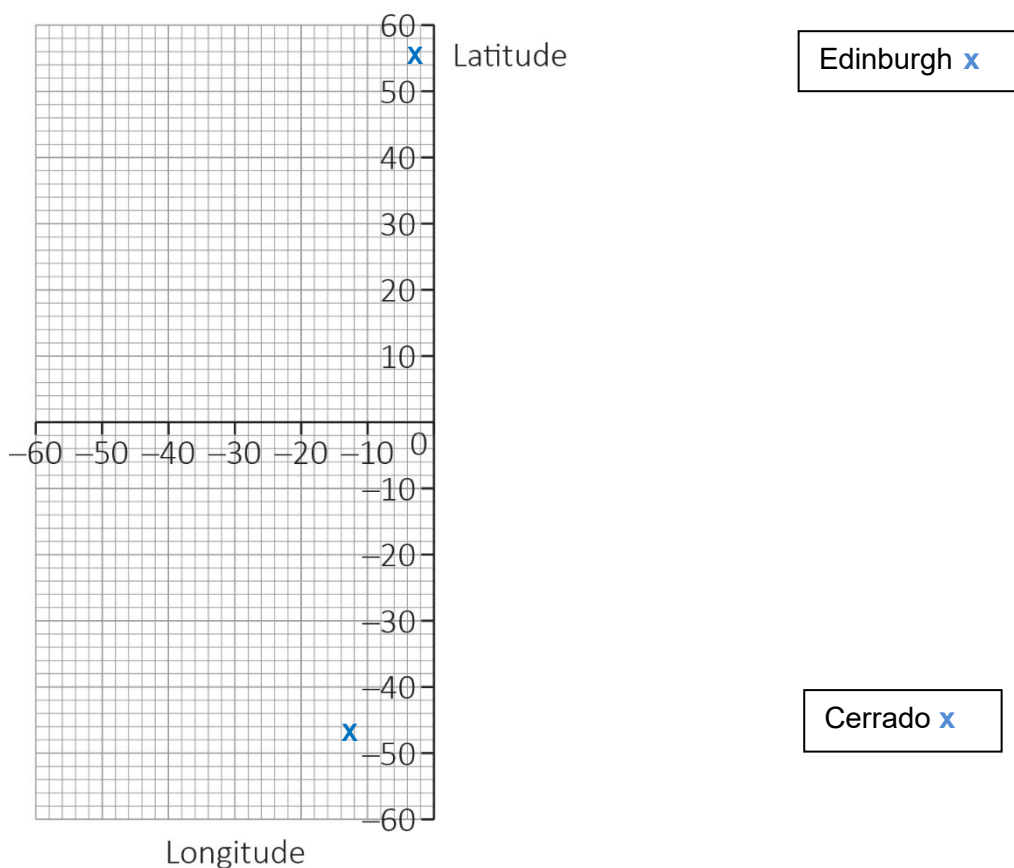| Q | Marks | UPS / PS | Process and Answer | Additional or Alternative Evidence (with guidance) | SC |
|---|---|---|---|---|---|
| **1 (a)** | **2** | **PS** | 19 892 000 OR 19.892 million | Award 2 marks if correct answer given | |
| | 1 | | 20 600 000 and 708 000 OR 20.6 and 0.708 OR 20600 and 708 | | N1a |
| | 1 | | 19 892 000 OR 19.892 million | OE | N1b |
| **1 (b)** | **3** | **PS** | 9(%) | Award 3 marks if correct answer given | |
| | 1 | | (476 + 280) ÷ 8400 (× 100 ) | OE | N5b |
| | 1 | | 0.09 | 0.09 implies 1st mark | N2a |
| | 1 | | 9(%) | CAO | N5b |
| **1 (c)** | **4** | **PS** | Yes and £33(.758) or (£)33.76 OR Yes AND (£)13(.254…) OR Yes AND 13(.254…) (p) OR Yes AND 229(.787…) or 230 (units) and 220(units) | Award 4 marks if correct answer given | |
| | 1 | | 220 | 220 from 16063 – 15843 May be seen or implied in subsequent working | N2a |
| | 1 | | Their 220 × 12.69 or 2791.8 OR their 220 x 0.1269 or 27.92 OR 35 – 5.84 or 29.16 OR 3500 – 584 or 2916 | OE Any correct method to work out cost of units used Accept their 220 × 13 or 2860 2791.8 or 27.92 implies 1st mark | M13a |
| | 1 | | Their 2791.8 + 584 OR their 27.92 + 5.84 OR their 29.16 ÷ 220 OR their 2916 ÷ 220 OR their 29.16 ÷ their 0.1269 OR their 2916 ÷ their 12.69 | OE Any correct method to find total cost FT Their 2791.8 or their 27.92 from correct method Must be consistent units | M13a |

| | | | Yes AND (£)33(.758) or (£)33.76 or (£)34 OR Yes AND (£)13(254…) OR Yes AND 13(.254…) (p) OR Yes AND 229(.787…) or 230 (units) and 220(units) | | |
|---|---|---|---|---|---|
| | 1 | | | OE Yes supported by correct working | M13a |
| 1 (d) | 1 | UPS | 0.739 | CAO | N10a |
| 1 (e) | 2 | UPS | $\frac{1}{3}$ | Award 2 marks if correct answer given | |
| | 1 | | $\frac{850}{2550}$ | OE | N8 |
| | 1 | | $\frac{1}{3}$ | CAO | N4 |
| 1 (f) | 3 | PS | See below | Award 3 marks if correct answer given | |
| | 1 | | 1550  1600   2100   2600 … or 3400   2800   2600   2100… | OE Any correct method to find median | H23a |
| | 1 | | 2350 | CAO | H23a |
| | 1 | | 23.5 or 24 (years) | FT their median value if in range of [1550, 3400] ÷ 100 or mean value 2341.6(666…) ÷ 100 Accept any correct rounding if mean value used Award this mark only for 23.5 or 24 seen without working | N11a |

| (Section B) Activity 2: Farming  (Calculator Test) | | | | | |
|---|---|---|---|---|---|
| Q | Marks | UPS / PS | Process and Answer | Additional or Alternative Evidence (with guidance) | SC |
| 2 (a) | 4 | PS | 260 (sacks of grass seed) | Award 4 marks if correct answer given | |
| | Alternative method 1 – Apply ratio first | | | | |
| | 1 | | 147 ÷ (2 + 5) or 21 or 147 ÷ (2 + 5) × 5 | OE Any correct method to work with ratio | N11a |
| | 1 | | 105 | CAO implies 1st mark | N11a |
| | 1 | | Their 105 × 2.47 or 259.35 | OE Any correct method to convert FT Their 105 from correct method for ratio | M14a |
| | 1 | | 260 (sacks of grass seed) | CAO | N9b |
| | Alternative method 2 – Convert first | | | | |
| | 1 | | 147 × 2.47 or 363.09 | OE Any correct method to convert | M14 |

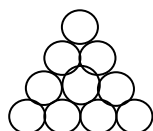| | | | | | |
|---|---|---|---|---|---|
| | 1 | | 363.09 | CAO implies 1st mark | N11a |
| | 1 | | 363.09 ÷ (2 + 5) or 51.87 OR 363.09 ÷ (2 + 5) × 5 or 259.35 | OE Any correct method to work with ratio FT Their 363.09 from correct method for conversion | N11a |
| | 1 | | 260 (sacks of grass seed) | CAO | N9b |
| 2 (b) | 2 | UPS | Two points correctly plotted – see below | | |
| | 1 | | Either Edinburgh or Cerrado plotted correctly | Edinburgh Red  =  -3, 55 Cerrado Blue =     -14, -47 Allow ± $\frac{1}{2}$ small square tolerance | M19 |
| | 1 | | Edinburgh and Cerrado plotted and labelled correctly | | M19 |

**Additional guidance**
Example



Edinburgh x

Cerrado x

| 2 (c) | 2 | UPS | See below | | |
|---|---|---|---|---|---|
| | 1 | | drawing using only circles 4 layers high | Mark intention | M21 |
| | 1 | | correct drawing | Mark intention | M21 |

**Additional guidance**
Example

| Q | Marks | UPS / PS | Process and Answer | Additional or Alternative Evidence (with guidance) | SC |
|---|---|---|---|---|---|
| 2 (d) | 4 | PS | No and 37(.96..) or 38 (mins)<br>OR<br>No and 4134 (secs) and 4556 (secs)<br>OR<br><br>No and 2700 (secs) and 2278(secs) | Award 4 marks if correct answer given | |
| | 1 | | 34 ÷ 2 × 402 or 6834 (seconds) or 113.9 or 114 (mins) | OE Any correct method to work out time for 402 cows with two units | M15 |
| | 1 | | Their 6834 ÷ 3 × 2<br>OR<br>34 ÷ 3 × 402 or 4556 (seconds) or 75.93 or 76 (mins) | OE Any correct method to work out time for 402 cows with three units | N11b |
| | 1 | | Their 6834 – their 4556) ÷ 60 or 37 (.96..)<br>OR<br>Their 6834 – 45 x 60 or 4134<br>OR<br>Their 6834 – their 4556 or 2278 AND 45 x 60 or 2700 | OE Any correct method to work with time difference<br>FT Their 6834 and their 4556 from correct methods | N2a |
| | 1 | | No and 37(.96..) or 38 (mins)<br>OR<br>No and 4134 (secs) and 4556 (secs)<br>OR<br>No and 2700 (secs) and 2278(secs) | OE No supported by correct working<br>Must be consistent units | N11b |
| 2 (e) | 3 | PS | No and 0.03<br><br>OR No and 53400 (litres) | Award 3 marks if correct answer given | |
| | 1 | | 80100 ÷ 267000000 × 100<br>OR 0.02 × 267000000 ÷ 100<br>OR<br>80 100 ÷ 0.0002 | OE Any correct method to work with percentage<br>Award if 8000 ÷ 267000000 x 100 as misread of 80100 | N5b |
| | 1 | | 0.03 OR 53400 OR 400 500 000 | CAO | N5b |
| | 1 | | No and 0.03 (%)<br>OR No AND 53400 (litres)<br><br>OR No AND 400 500 000 (litres) | No supported by correct working | N5b |

| Activity 3: | | Flower shop | (Calculator Test) | | |
|---|---|---|---|---|---|

| Q | Marks | UPS / PS | Process and Answer | Additional or Alternative Evidence (with guidance) | SC |
|---|---|---|---|---|---|
| 3 (a) | 3 | PS | Yes and [93, 94]p or 449.06(25) | Award 3 marks if correct answer given | |
| | 1 | | $\frac{24000}{60} + \left(\frac{24000 - 450}{12}\right) \times \frac{2.5}{100}$ | OE  OE Correct substitution<br><br>Award if 2.5% indicated in formula | N3 |
| | 1 | | 400 + 1962.5(0) × 0.025 or<br>400 + 49.0625 or 449.06(25) | OE Implies 1st mark<br><br>FT their values from correct substitution in formula | N12 |

| | | | | | |
|---|---|---|---|---|---|
| | 1 | | Yes and [93, 94]p or 449.06(25) | OE Yes supported by correct working | N3 |
| 3 (b) | 5 | PS | See below | | |
| | 1 | | (0.25 ×) 3.14 × 4.35² or 59.41(665) | OE Any correct method to find area of a circle or quarter circle<br><br>Accept [59.4, 59.4545] from use of π button and/or rounding | M16b |
| | 1 | | 14.85(..) | CAO<br><br>Accept [14.85,14.864] OR 14.9 OR 15 from use of π button and/or rounding<br><br>Implies 1st mark | M16b |
| | 1 | | (£)26 | CAO Mode<br><br>May be seen in subsequent working | H23b |
| | 1 | | Their 15 × their 26 | OE Any correct method to work out cost using rounded up value<br><br>FT Their 15 from their area of quarter circle rounded up from correct method<br><br>Their 26 must be in the range [19,28] | N9b |
| | 1 | | (£)390 | FT Their answer to their 15 × 26 from correct methods<br><br>Award this mark for 390 seen without working | M13a |
| 3 (c) | 1 | UPS | 5 | CAO | N1b |
| 3 (d) | 2 | UPS | 64(°) | Award 2 marks if correct answer given | |
| | 1 | | (360 – 2 × 116) ÷ 2 | OE Any correct method to work out angle | M22a |
| | 1 | | 64(°) | CAO | M22a |
| 3 (e) | 3 | PS | 0.225 or 22.5% or $\frac{9}{40}$ | | |
| | 1 | | $\frac{3}{8}$ or 37.5(%) or 0.375 OR<br><br>0.6 or 60(%) or 6/10 | OE | H27 |
| | 1 | | $\frac{3}{8}$ × 0.6<br><br>OR<br><br>0.375 x 0.6 | OE | H26 |
| | 1 | | 0.225 or 22.5% or $\frac{9}{40}$ | OE<br>Accept 9 out of 40, 9 over 40, 9 in 40, nine out forty etc | H27 |
| 3 (f) | 1 | UPS | £58.08 | | M13b |

| Activity 4: | | Narrowboat holiday | (Calculator Test) | | |
|---|---|---|---|---|---|
| Q | Marks | UPS / PS | Process and Answer | Additional or Alternative Evidence (with guidance) | SC |
| 4 (a) | 2 | PS | $\frac{3}{18}$ or $\frac{1}{6}$ | Award 2 marks if correct answer given | |
| | 1 | | 3 | CAO | H28 |
| | 1 | | $\frac{3}{18}$ or $\frac{1}{6}$ | OE FT their 3 (between 1 and 18)<br>Accept 1 in 6, 1 over 6, 1 out of 6, one sixth | N8 |
| 4 (b) | 4 | PS | (£)412 | | |
| | 1 | | [(3 × 1250) + (5 × 1750) + (2 × 2250) or 3750 + 8750 + 4500 or 17000 | Must use mid points | H24 |
| | 1 | | Their 17000 ÷ 10 or 1700 | 1700 implies 1st mark<br>Their 17000 must come from consistent use of midpoints or of upper bounds or of lower bounds | H24 |
| | 1 | | their 1700 ÷ 5 or 340 or (their 1700 + 360) ÷ 5 | their 1700 must come from consistent use of midpoints or of upper bounds or of lower bounds<br>Award if ÷ 4 seen | N11a |
| | 1 | | (£)412 | CAO | M13a |
| 4 (c) | 2 | PS | No and 20 (km)<br><br>OR No and 0.4 (cm) | Award 2 marks if correct answer given | |
| | 1 | | 4 × 500000 ÷ 100000 or 20<br>OR 2 × 100000 ÷ 500000 | OE | M18a |
| | 1 | | No and 20 (km)<br><br>OR<br><br>No and 0.4 (cm) | | M18a |
| 4 (d) | 4 | PS | 2 hours 15 minutes | Award 4 marks if correct answer given | |
| | 1 | | 8.4 ÷ 8 × 5 or 5.25 (miles or miles per hour or mph)<br>or 3 ÷ 5 × 8 or 4.8 (km or km per hour or kph) | OE | M14a |
| | 1 | | (8.4 ÷ 8 × 5) ÷ 3<br>or 8.4 ÷ (3 ÷ 5 × 8) or 1.75 | Implies 1st mark | M15 |
| | 1 | | 1.75 (hours) | OE implies 1st and 2nd marks | M15 |
| | 1 | | 2 hours 15 minutes | CAO | N11a |
| 4 (e) | 3 | UPS | 12.5 and 13(…) and Joe indicated | Award 3 marks for correct decision supported by valid working | |
| | 1 | | 12.5 | | H25 |

| | 1 | | 13(…) | If 1st and 2nd marks not awarded, award 1 mark for correct method for both means | H25 |
| --- | --- | --- | --- | --- | --- |
| | 1 | | 12.5 and 13(…) and Joe indicated | OE Joe supported by correct working | H25 |