National Qualifications 2016

2016 Lifeskills Mathematics

National 5 Paper 1

Finalised Marking Instructions

General Marking Principles for National 5 Lifeskills Mathematics

This information is provided to help you understand the general principles you must apply when marking candidate responses to questions in this Paper. These principles must be read in conjunction with the detailed marking instructions, which identify the key features required in candidate responses.

For each question the marking instructions are generally in two sections, namely Illustrative Scheme and Generic Scheme. The Illustrative Scheme covers methods which are commonly seen throughout the marking. The Generic Scheme indicates the rationale for which each mark is awarded. In general, markers should use the Illustrative Scheme and only use the Generic Scheme where a candidate has used a method not covered in the Illustrative Scheme.

(a) Marks for each candidate response must always be assigned in line with these General Marking Principles and the Detailed Marking Instructions for this assessment.

(b) Marking should always be positive. This means that, for each candidate response, marks are accumulated for the demonstration of relevant skills, knowledge and understanding: they are not deducted from a maximum on the basis of errors or omissions.

(c) If a specific candidate response does not seem to be covered by either the principles or detailed Marking Instructions, and you are uncertain how to assess it, you must seek guidance from your Team Leader.

(d) Credit must be assigned in accordance with the specific assessment guidelines.

(e) One mark is available for each •. There are no half marks.

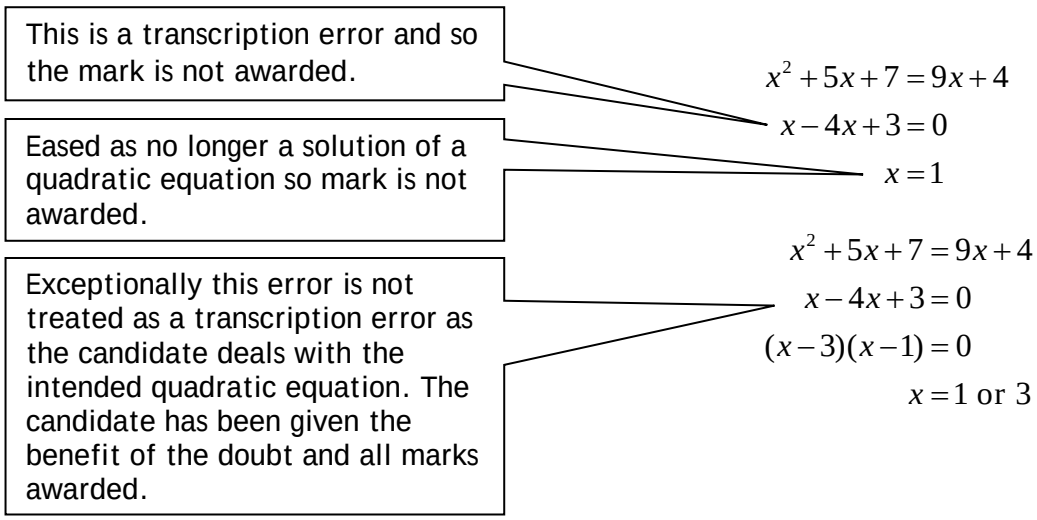
(f) Working subsequent to an error must be **followed through**, with possible credit for the subsequent working, provided that the level of difficulty involved is approximately similar. Where, subsequent to an error, the working for a follow through mark has been eased, the follow through mark cannot be awarded.

(g) As indicated on the front of the question paper, full credit should only be given where the solution contains appropriate working. Unless specifically mentioned in the marking instructions, a correct answer with no working receives no credit.

(h) Candidates may use any mathematically correct method to answer questions except in cases where a particular method is specified or excluded.

(i) As a consequence of an error perceived to be trivial, casual or insignificant, eg $6 \times 6 = 12$ candidates lose the opportunity of gaining a mark. However, note the second example in comment **(j)**.

(j) Where a transcription error (paper to script or within script) occurs, the candidate should normally lose the opportunity to be awarded the next process mark, eg



(k) Horizontal/vertical marking

Where a question results in two pairs of solutions, this technique should be applied, but only if indicated in the detailed marking instructions for the question.

Example:

	$\bullet^5$	$\bullet^6$
$\bullet^5$	$x=2$	$x=-4$
$\bullet^6$	$y=5$	$y=-7$

Horizontal: $\bullet^5$ $x=2$ and $x=-4$ Vertical: $\bullet^5$ $x=2$ and $y=5$
$\bullet^6$ $y=5$ and $y=-7$ $\bullet^6$ $x=-4$ and $y=-7$

Markers should choose whichever method benefits the candidate, but **not** a combination of both.

(l) In final answers, unless specifically mentioned in the detailed marking instructions, numerical values should be simplified as far as possible, eg:

$\frac{15}{12}$ must be simplified to $\frac{5}{4}$ or $1\frac{1}{4}$ $\frac{43}{1}$ must be simplified to 43

$\frac{15}{0\cdot3}$ must be simplified to 50 $\frac{4/5}{3}$ must be simplified to $\frac{4}{15}$

$\sqrt{64}$ must be simplified to 8*****

*The square root of perfect squares up to and including 100 must be known.

(m) Commonly Observed Responses (COR) are shown in the marking instructions to help mark common and/or non-routine solutions. CORs may also be used as a guide when marking similar non-routine candidate responses.

(n) Unless specifically mentioned in the marking instructions, the following should not be penalised:

- Working subsequent to a correct answer
- Correct working in the wrong part of a question
- Legitimate variations in numerical answers/algebraic expressions, eg angles in degrees rounded to nearest degree
- Omission of units
- Bad form (bad form only becomes bad form if subsequent working is correct), eg $(x^3+2x^2+3x+2)(2x+1)$ written as $(x^3+2x^2+3x+2)\times 2x+1$

  $2x^4+4x^3+6x^2+4x+x^3+2x^2+3x+2$ written as $2x^4+5x^3+8x^2+7x+2$ gains full credit

- Repeated error within a question, but not between questions or papers

(o) In any 'Show that…' question, where the candidate has to arrive at a required result, the last mark of that part is not available as a follow-through from a previous error unless specified in the detailed marking instructions.

(p) All working should be carefully checked, even where a fundamental misunderstanding is apparent early in the candidate's response. Marks may still be available later in the question so reference must be made continually to the marking instructions. The appearance of the correct answer does not necessarily indicate that the candidate has gained all the available marks.

(q) Scored-out working which has not been replaced should be marked where still legible. However, if the scored out working has been replaced, only the work which has not been scored out should be marked.

(r) Where a candidate has made multiple attempts using the same strategy and not identified their final answer, mark all attempts and award the lowest mark.

For example:

Strategy 1 attempt 1 is worth 3 marks.	Strategy 2 attempt 1 is worth 1 mark.
Strategy 1 attempt 2 is worth 4 marks.	Strategy 2 attempt 2 is worth 5 marks.
From the attempts using strategy 1, the resultant mark would be 3.	From the attempts using strategy 2, the resultant mark would be 1.

In this case, award 3 marks.

Detailed Marking Instructions for each question

Question			Generic Scheme	Illustrative Scheme	Max Mark
1.			**Ans: 9 kg bag supported by working**		**3**
			• [1] Strategy: attempt to find price of 1kg of each	• [1] £25·65 ÷ 9 and £57·20 ÷ 20	
			• [2] Process: finds price of one kg of each.	• [2] £2·85 and £2·86	
			• [3] Communication: select best value	• [3] 9 kg bag better value	
			Alternative strategies:		
			Alternative 1		
			• [1] Strategy: attempt to find price of 1kg then multiply by 20	• [1] £25·65 ÷ 9 x 20	
			• [2] Process: calculates correctly	• [2] £57	
			• [3] Communication: select best value	• [3] 9 kg bag better value	
			Alternative 2		
			• [1] Strategy: attempts to multiply and add on additional weight	• [1] 2 × 9 kg + 2 kg 2 × 25·65 and attempt of 2/9 of 25·65	
			• [2] Process: calculates correctly	• [2] 57	
			• [3] Communication: select best value	• [3] 9 kg bag better value	
			Alternative 3		
			• [1] Strategy: attempt to find price of 180kg of each	• [1] 20 × 25·65 and 9 × 57·20	
			• [2] Process: calculates correctly	• [2] 513 and 514·80	
			• [3] Communication: select best value	• [3] 9 kg bag better value	

Question	Generic Scheme	Illustrative Scheme	Max Mark
Notes:			
Commonly Observed Responses:			

Question			Generic Scheme	Illustrative Scheme	Max Mark
2.			**Ans: 6/36 (1/6)** •^{1} Strategy: know to find total combinations •^{2} Process: find all combinations totalling 10 or more •^{3} Communication: state fraction	 •^{1} evidence of the 36 combinations •^{2} 6 combinations •^{3} 6/36 (= 1/6)	**3**

Notes:

1. The combinations need not be listed for award of •^{1} and •^{2}.

2. •^{3} can only be awarded if clear evidence of where numerator & denominator came from.

3. a) $\frac{6}{36} = \left(\frac{1}{6}\right)$ no working award 3/3 ✓✓✓

b) $\frac{1}{6}$ **or** $\left(\frac{2}{12}\right)$ no working award 0/3 ×××

4. a) $\frac{3}{36}$ no working award 2/3 ✓×✓

b) $\frac{6}{12}$ no working award 1/3 ×✓×

c) $\frac{4}{12}$ or $\frac{3}{12}$ no working award 0/3 ×××

Commonly Observed Responses:

Question			Generic Scheme	Illustrative Scheme	Max Mark
3.			**Ans: 0853 (from Biggar)** • [1] Strategy: evidence of working back from 11.30am • [2] Communication: choose the correct bus	 • [1] evidence • [2] 0853 from Biggar	**2**
Notes: 1. Correct answer with no working award 2/2					
Commonly Observed Responses:					

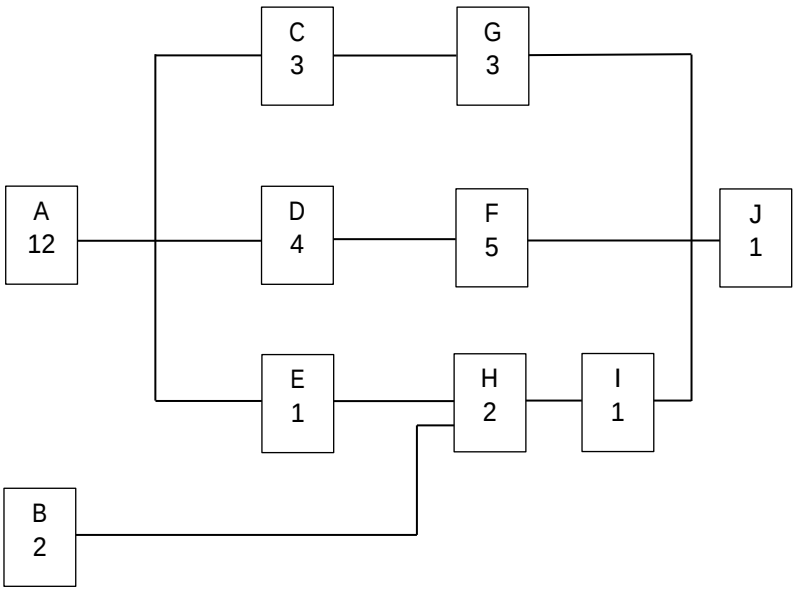
Question			Generic Scheme	Illustrative Scheme	
4.			**Ans: 7 weeks** •[1] Strategy: knows how to find left over money •[2] Process: finds left over money •[3] Process/Communication: find number of weeks, rounded appropriately	 •[1] (7·30 × 30) − (5·32 + 7·68 + 86) •[2] 120 •[3] (388 ÷ 60 = 6·46…) → 7 weeks	**3**

Notes:

1. Correct answer with no working award 0/3
2. If candidate writes 6·44 •[3] is not available

Commonly Observed Responses:

Question			Generic Scheme	Illustrative Scheme	Max Mark
5.	(a)		**Ans: task letters and times inserted correctly** • [1] Strategy: start to allocate tasks • [2] Strategy: complete allocation of tasks	 • [1] any 5 boxes • [2] remaining 4 boxes	**2**



Notes:

1. If candidate puts only correct letter and no number in boxes award 1/2

Commonly Observed Responses:

Question			Generic Scheme	Illustrative Scheme	Max Mark
	(b)		**Ans: Yes supported with working** •[1] Strategy: select critical path •[2] Communication: yes as it only takes 22 months	 •[1] 12 + 4 + 5 + 1 •[2] yes, it takes 22 months	**2**

Notes:

Commonly Observed Responses (No working necessary)

1. 34 $\longrightarrow$ no not possible award 1/2
2. 19 $\longrightarrow$ yes it is possible award 1/2
3. 17 $\longrightarrow$ yes it is possible award 1/2
4. 6 $\longrightarrow$ yes it is possible award 1/2

Question			Generic Scheme	Illustrative Scheme	Max Mark
6.			**Ans: (£)369·95**		**5**
			•^{1} Strategy: use correct form of Pythagoras Theorem including 30	•^{1} $x^2 = 30^2 + 40^2$	
			•^{2} Process: correct length of 4th side	•^{2} $\sqrt{2500} = 50$	
			•^{3} Strategy: know how to calculate number of rolls	•^{3} (50 + 130 + 40 + 160) ÷ 80	
			•^{4} Process/Communication: correctly rounded answer	•^{4} 4·75 = 5 rolls	
			•^{5} Process: calculate cost	•^{5} 5 × 73·99 = 369·95	

Notes:

1. •^{2} is only available if Pythagoras has been attempted.
2. •^{3} is only available if 4 sides have been considered.
3. If only 3 sides are considered only marks •^{4} and •^{5} are available.
4. •^{4} is available for counting up in 80s to 400 leading to 5 rolls needed.
5. If dividing by 80 •^{4} is only available if rounding is necessary.

Commonly Observed Responses:

(l × b × h) ÷ 80 = 832000 ÷ 80 = 10400 rolls.•^{4} is not available as no rounding is necessary.
•^{5} is still available for calculating cost

Question			Generic Scheme	Illustrative Scheme	Max Mark
7.			**Ans: (£)7·26** •[1] Strategy: pick correct band •[2] Communication: pick consistent values from table •[3] Process/Communication: conclusion	 •[1] band F (could be implied by subsequent working) •[2] 76·13 and 145 •[3] 2 × 76·13 − 145 = 7·26	**3**

Notes:

1. •[1] and •[2] may be highlighted on the table

Commonly Observed Responses:

1. For 152·25 − 145 = 7·25 award 2/3 ✓×✓
2. For 2 x 79·75 − 145 = 14·50 award 2/3 ✓×✓

Question			Generic Scheme	Illustrative Scheme	Max Mark
8.			**Ans: 138 m^2** •^{1} Strategy: rectangle – ½ circle •^{2} Process: find the area of the sandpit •^{3} Process: find area to be covered in rubber tiles •^{4} Communication: round correctly **and** use appropriate units.	 •^{1} evidence •^{2} $\frac{1}{2}\times 3{\cdot}14\times 3\times 3 = 14{\cdot}13$ •^{3} $8 \times 19 - 14{\cdot}13 = 137{\cdot}87$ •^{4} 138 m^2	**4**

Notes:

1. •^{2} is available for finding area of a whole circle with radius 3 but •^{1} is not available in this case.
2. •^{3} is only available for subtracting from 152.
3. If candidate does $152 - 14 = 138$ •^{4} is not available as premature rounding is not appropriate.

Commonly Observed Responses

Question			Generic Scheme	Illustrative Scheme	Max Mark
9.			**Ans: 8 (cm)** •^{1} Strategy: knows how to use scale factor to find area of card •^{2} Strategy: knows to divide scaled area of card by 7 •^{3} Process: find missing length	 •^{1} $4 \times 5 \times 2{\cdot}8$ •^{2} $\ldots \div 7$ •^{3} 8 cm	**3**

Notes:

1. Correct answer with no working 0/3
2. •^{2} is only available for dividing the scaled area by 7.
3. •^{3} is not available to candidates who have not considered the scale factor.
4. For $(4 \times 5 + 2{\cdot}8) \div 7$ award mark •^{2}
5. •^{3} can be awarded for 3·2571… rounded or truncated to at least 1 decimal place. NB do not award •^{3} for 3·24
6. •^{3} is not available if the candidate treats scaled area as the perimeter.
7. eg $(56 - 7 \times 2) \div 2 = 21$

Commonly Observed Responses:

Question			Generic Scheme	Illustrative Scheme	Max Mark
10.	(a)		**Ans: 1/18** •[1] Process: find the correct vertical difference •[2] Process: consistent units between the two values •[3] Strategy/Process: calculate gradient in its simplest form	 •[1] 250 (m) •[2] 4·5 km = 4500 m or 250 m = 0·25 km •[3] 250/4500 = 1/18	**3**
Notes:					
Commonly Observed Responses: 320/4500 = 16/225 award marks •[2] and •[3]					

Question			Generic Scheme	Illustrative Scheme	Max Mark
	(b)		**Ans: Yes, supported by working**		**2**
			• [1] Strategy: know how to compare gradients	• [1] Convert 1/18 to 2/36 **or** convert 2/25 to 1/12·5 **or** convert both fractions to 25/450 & 36/450	
			• [2] Communication: state conclusion consistent with working	• [2] Yes, 2/25 > 2/36	

Notes:

1. If the candidate's answer to (a) is an improper fraction then only the communication mark is available.

Commonly Observed Responses:

[END OF MARKING INSTRUCTIONS]