National
Qualifications
2023

2023 Mathematics

Paper 1 – (Non-calculator)

National 5

Finalised Marking Instructions

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General marking principles for National 5 Mathematics

Always apply these general principles. Use them in conjunction with the detailed marking instructions, which identify the key features required in candidates' responses.

For each question, the marking instructions are generally in two sections:

generic scheme — this indicates why each mark is awarded
illustrative scheme — this covers methods which are commonly seen throughout the marking

In general, you should use the illustrative scheme. Only use the generic scheme where a candidate has used a method not covered in the illustrative scheme.

(a) Always use positive marking. This means candidates accumulate marks for the demonstration of relevant skills, knowledge and understanding; marks are not deducted for errors or omissions.

(b) If you are uncertain how to assess a specific candidate response because it is not covered by the general marking principles or the detailed marking instructions, you must seek guidance from your team leader.

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

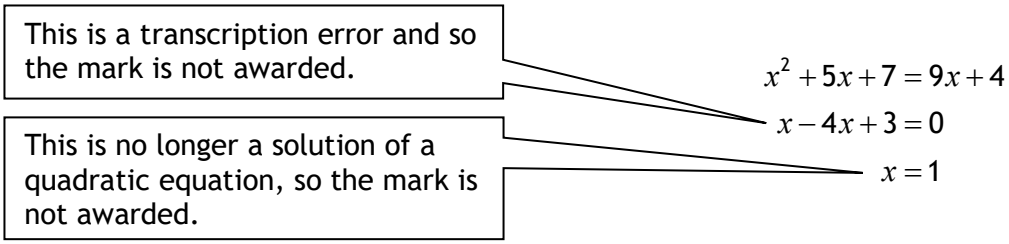
(d) If a candidate's response contains an error, all working subsequent to this error must still be marked. Only award marks if the level of difficulty in their working is similar to the level of difficulty in the illustrative scheme.

(e) Only award full marks where the solution contains appropriate working. A correct answer with no working receives no mark, unless specifically mentioned in the marking instructions.

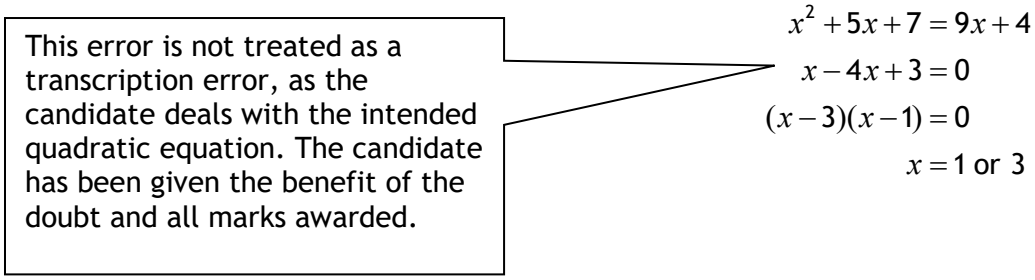
(f) Candidates may use any mathematically correct method to answer questions, except in cases where a particular method is specified or excluded.

(g) If an error is trivial, casual or insignificant, for example 6 x 6 = 12, candidates lose the opportunity to gain a mark, except for instances such as the second example in point (h) below.

(h) If a candidate makes a transcription error (question paper to script or within script), they lose the opportunity to gain the next process mark, for example



The following example is an exception to the above



(i) Horizontal/vertical marking

If a question results in two pairs of solutions, apply the following technique, 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 $x = -4$ $\quad$ $\bullet^6$ $y = 5$ and $y = -7$

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

You must choose whichever method benefits the candidate, **not** a combination of both.

(j) In final answers, candidates should simplify numerical values as far as possible unless specifically mentioned in the detailed marking instruction. For example

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

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

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

*The square root of perfect squares up to and including 144 must be known.

(k) 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.

(l) Do not penalise candidates for any of the following, unless specifically mentioned in the detailed marking instructions:

- working subsequent to a correct answer
- correct working in the wrong part of a question
- legitimate variations in numerical answers/algebraic expressions, for example angles in degrees rounded to nearest degree
- omission of units
- bad form (bad form only becomes bad form if subsequent working is correct), for example

  $(x^3+2x^2+3x+2)(2x+1)$ written as

  $(x^3+2x^2+3x+2)\times 2x+1$

  $=2x^4+5x^3+8x^2+7x+2$

  gains full credit

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

(m) In any 'Show that…' question, where candidates have to arrive at a required result, the last mark is not awarded as a follow-through from a previous error, unless specified in the detailed marking instructions.

(n) You must check all working carefully, even where a fundamental misunderstanding is apparent early in a candidate's response. You may still be able to award marks later in the question so you must refer continually to the marking instructions. The appearance of the correct answer does not necessarily indicate that you can award all the available marks to a candidate.

(o) You should mark legible scored-out working that has not been replaced. However, if the scored-out working has been replaced, you must only mark the replacement working.

(p) If candidates make multiple attempts using the same strategy and do not identify their final answer, mark all attempts and award the lowest mark. If candidates try different valid strategies, apply the above rule to attempts within each strategy and then award the highest 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.

Marking Instructions for each question

Question	Generic scheme	Illustrative scheme	Max mark
1.	•1 convert to improper fraction and multiply by the reciprocal •2 consistent answer	•1 $\frac{13}{6}\times\frac{9}{8}$ •2 $\frac{39}{16}$ or $2\frac{7}{16}$	**2**

Notes:

1. Correct answer without working — award 0/2
2. Final answer must be in simplest form, eg $\frac{13}{6}\times\frac{9}{8}=\frac{117}{48}$ — award 1/2 ✓✓2
3. •2 is only available where simplifying is required.
4. Do not penalise incorrect conversion of $\frac{39}{16}$ to a mixed number.

Commonly Observed Responses:

1. $\frac{13}{6}\times\frac{8}{9}=\frac{52}{27}$ — award 1/2 ×✓1
2. $\frac{6}{13}\times\frac{8}{9}=\frac{16}{39}$ — award 1/2 ×✓1
3. (a) $\frac{13}{6}\times\frac{9}{8}\rightarrow\frac{6}{13}\times\frac{9}{8}=\frac{27}{52}$ — award 1/2 ✓×
   (b) $\frac{6}{13}\times\frac{9}{8}=\frac{27}{52}$ — award 1/2 ×✓1
4. $2\frac{1}{6}\times\frac{9}{8}\rightarrow 2\frac{1}{2}\times\frac{3}{8}\rightarrow 2\frac{3}{16}$ — award 0/2

2.	•1 start expansion •2 complete expansion •3 collect like terms (see Note 2)	•1 $x^2 + 7x + 7x + 49$ or $6x^2 - 60$ •2 $x^2 + 7x + 7x + 49 + 6x^2 - 60$ •3 $7x^2 + 14x - 11$	**3**

Notes:

1. Correct answer without working — award 3/3
2. For the award of •3, the evidence at •2 must include an x^2 term. At least one term must be negative.
3. For subsequent incorrect working, the final mark is not available.

Commonly Observed Responses:

1. $x^2 + 49 + 6x^2 - 60 = 7x^2 - 11$ — award 2/3 ✓×✓1

Question			Generic scheme	Illustrative scheme	Max mark
3.			•[1] correct scaling	•[1] eg $10x+15y=40$, $10x+4y=-4$ **OR** $4x+6y=16$, $15x+6y=-6$	**3**
			•[2] value for one variable	•[2] $x=-2$ or $y=4$	
			•[3] value for other variable	•[3] $y=4$ or $x=-2$	

Notes:

1. Correct answers without working — award 0/3
2. Answers obtained by repeated substitution — award 0/3
3. Following an earlier error, accept rounded answers given to at least 1 decimal place.

Commonly Observed Responses:

4.	(a)	(i)	•[1] state value of a	•[1] -3	**1**
		(ii)	•[2] state value of b	•[2] 2	**1**

Notes:

1. Where the values of a and b are not stated explicitly, for a final answer of $y = (x - 3)^2 + 2$ — award 1/1 for (i) and 1/1 for (ii)
2. For an answer of $a = 2$, $b = -3$ — award 0/1 mark for (i) and 1/1 for (ii) ×✓1

Commonly Observed Responses:

1. $y=(x-3)^2+2 \rightarrow a=3,\ b=2$ — award 0/1 mark for (i) and 1/1 for (ii) ×✓1
2. $y=(x+3)^2+2 \rightarrow a=-3,\ b=2$ — award 1/1 mark for (i) and 1/1 for (ii)

	(b)		•[3] find value of c	•[3] 11	**1**

Notes:

1. Answer must be consistent with answers to (a).
2. Accept (0,11) or $y = 11$.

Commonly Observed Responses:

Question	Generic scheme	Illustrative scheme	Max mark
5.	$\bullet^1$ calculate discriminant $\bullet^2$ state nature of roots	$\bullet^1$ 52 $\bullet^2$ 2 real (and) distinct roots	**2**

Notes:

1. Correct answer without working award 0/2

2. For $36-(-16)>0$ or $36+16>0 \rightarrow$ 2 real (and) distinct roots award 2/2

3. For the award of $\bullet^2$ accept "2 real unequal roots".

4. Do not accept "2 real roots" or "2 distinct roots" or "real and distinct roots".

5. Expected answers for the award of $\bullet^2$, when
   (a) $b^2 - 4ac < 0$: "no real roots".
   (b) $b^2 - 4ac = 0$: "1 repeated real root" or "2 equal real roots".

6. Accept $\sqrt{52}$ as evidence for $\bullet^1$ in a quadratic formula or alone.

Commonly Observed Responses:

Question	Generic scheme	Illustrative scheme	Max mark
6.	•1 correct substitution into cosine rule •2 calculate AB^2 •3 calculate AB	•1 $6^2+5^2-2\times6\times5\times\frac{1}{5}$ •2 49 •3 7	**3**

Notes:

1. Correct answer without working — award 0/3

2. (a) $6^2+5^2-2\times6\times5\times\cancel{\cos}\frac{1}{5}=61-60\times\cancel{\cos}\frac{1}{5}=49\rightarrow7$

   where cos is scored out in **each line** of working — award 3/3

   (b) For $6^2+5^2-2\times6\times5\times\cos\frac{1}{5}=49\rightarrow7$ — award 2/3 ×✓✓

3. For the award of •1 accept eg $\frac{1}{5}=\frac{6^2+5^2-AB^2}{2\times6\times5}$

4. •3 is **only** available where AB^2 has been obtained from a cosine rule calculation by:
   (a) calculating the square root of a perfect square (>4)

   OR

   (b) expressing a surd in its simplest form.

5. Where sine rule or area of triangle formula is used — award 0/3

Commonly Observed Responses:

1. $6^2+5^2+2\times6\times5\times\frac{1}{5}\rightarrow\sqrt{73}$ — award 1/3 ×✓1×
2. (a) $\sqrt{6^2+5^2}=\sqrt{61}$ — award 0/3

   (b) $\sqrt{6^2-5^2}=\sqrt{11}$ — award 0/3

Question			Generic scheme	Illustrative scheme	Max mark
7.	(a)		**Method 1** •[1] calculate gradient •[2] substitute gradient and a point into $y - b = m(x - a)$ •[3] determine the equation of the line in terms of P and T in simplest form **Method 2** •[1] calculate gradient •[2] substitute gradient and a point into $y = mx + c$ •[3] determine the equation of the line in terms of P and T in simplest form	•[1] 1500 •[2] eg $y - 20000 = 1500\,(x - 5)$ •[3] $P = 1500T + 12500$ •[1] 1500 •[2] eg $20000 = 1500 \times 5 + c$ •[3] $P = 1500T + 12500$	**3**

Notes:

1. Correct answer without working — award 0/3
2. Accept $\frac{30000}{20}$ or equivalent for the award of •[1].
3. •[1] is not available for using points other than (5, 20 000), (15, 35 000) and (25, 50 000) to find the gradient.
4. For an incorrect simplification of a gradient, a mark is **not** awarded at the point where the error occurs, eg
   (a) $\frac{30000}{20} = 15000 \rightarrow y - 20000 = 15000(x - 5) \rightarrow P = 15000T - 55000$ — award 2/3 ×✓1✓1
   (b) $\frac{30000}{20} \rightarrow y - 20000 = 15000(x - 5) \rightarrow P = 15000T - 55000$ — award 2/3 ✓×✓1
   (c) $\frac{30000}{20} \rightarrow y - 20000 = \frac{30000}{20}(x - 5) \rightarrow P = 15000T - 55000$ — award 2/3 ✓✓×

Commonly Observed Responses:

Working must be shown

1. $P = \frac{1500}{1}T + 12500$ — award 2/3 ✓✓×
2. Using (1,2) and (5,5): eg gradient = $\frac{3}{4} \rightarrow 2 = \frac{3}{4} \times 1 + c \rightarrow P = \frac{3}{4}T + \frac{5}{4}$ — award 2/3 ×✓1✓1
3. Using (5,20) and (25, 50): eg gradient = $\frac{3}{2} \rightarrow 20 = \frac{3}{2} \times 5 + c \rightarrow P = \frac{3}{2}T + \frac{25}{2}$ — award 2/3 ×✓1✓1

Question			Generic scheme	Illustrative scheme	Max mark
7.	(b)		$\bullet^4$ calculate salary	$\bullet^4$ (£)24,500	**1**

Notes:

1. Consistent answer without working (but see note 2) award 1/1

2. Where an incorrect answer in (a) is followed through, $\bullet^4$ is not available where the answer is:
   (a) negative
   (b) expressed in fraction form eg $P = \frac{3}{4}T + \frac{5}{4} \rightarrow \frac{29}{4}$
   (c) given to one decimal place or more than two decimal places
   $P = 1.5T + 12.5 \rightarrow 24.5$

Commonly Observed Responses:

1. $P = \frac{3}{4}T + \frac{5}{4}$ in (a) leading to (£) 7.25 award 1/1

2. $P = \frac{3}{2}T + \frac{25}{2}$ in (a) leading to (£) 24.50 award 1/1

8.			$\bullet^1$ express as equivalent fraction with rational denominator $\bullet^2$ express in simplest form	$\bullet^1 \frac{12\sqrt{15}}{15}$ $\bullet^2 \frac{4\sqrt{15}}{5}$	**2**

Notes:

1. Correct answer without working award 0/2

2. Accept $0.8\sqrt{15}$.

3. For subsequent incorrect working, $\bullet^2$ is not available
   eg $\frac{12\sqrt{15}}{15} = \frac{4\sqrt{15}}{5} = 4\sqrt{3}$ award 1/2 ✓×

Commonly Observed Responses:

1. (a) $\frac{12}{3\sqrt{5}} = \frac{4}{\sqrt{5}} = \frac{4\sqrt{5}}{5}$ award 1/2 $\bullet^2$ × $\bullet^1$✓1

   (b) $\frac{12}{3\sqrt{5}} = \frac{4}{\sqrt{5}}$ award 0/2

Question			Generic scheme	Illustrative scheme	Max mark
9.	(a)		$\bullet^1$ calculate median $\bullet^2$ find quartiles $\bullet^3$ calculate IQR	$\bullet^1$ 39.5 $\bullet^2$ 35 and 42 $\bullet^3$ 7	**3**

Notes:

1. (a) Correct median without working award $\bullet^1$.
   (b) Correct IQR without working, do **not** award $\bullet^2$ or $\bullet^3$.

2. Accept quartiles indicated in the list or on a diagram for $\bullet^2$.

3. If 'correct' IQR is found from an
   (a) ordered list with one missing term or one extra number — award 2/3 ×✓1✓1
   (b) unordered list [median = 38.5, IQR = 41 – 38 =3] — award 1/3 ××✓1

4. $\bullet^2$ and $\bullet^3$ are not available for finding the range ie 55 – 31 = 24.

5. Where a candidate has calculated SIQR= 3.5, $\bullet^3$ can only be awarded where the candidate has **explicitly** stated "IQR = 7" eg
   (a) median = 39.5, quartiles = 35 and 42, **IQR = 7**, SIQR = 3.5 — award 3/3
   (b) median = 39.5, quartiles = 35 and 42 $\rightarrow$ (IQR =) 3.5 — award 2/3 ✓✓×

6. Where a candidate has calculated the IQR but stated SIQR = 7, $\bullet^3$ is available
   eg median = 39.5, quartiles = 35 and 42, **SIQR** = 7 — award 3/3

Commonly Observed Responses:

Question			Generic scheme	Illustrative scheme	Max mark
9.	(b)		$\bullet^4$ valid comment comparing medians $\bullet^5$ valid comment comparing IQRs	$\bullet^4$ eg on average the ages of the newspaper readers are higher $\bullet^5$ eg ages of the newspaper readers are more varied	**2**

Notes:

1. Answers must be consistent with answers to part (a).
   eg If in part (a) the calculated median is 41 then award $\bullet^4$ for 'on average the ages are the same for the newspaper and the magazine' or equivalent.
   If in part (a) the calculated IQR is 9 then award $\bullet^5$ for 'the spread of ages is the same for the newspaper and the magazine' or equivalent.

2. Comments must involve reference to ages **and** include newspaper readers and/or magazine readers.
   (a) **Accept** eg On average the **newspaper readers' ages** are higher and less consistent.
   (b) **Do not accept** eg On average the **ages** are higher and less consistent.

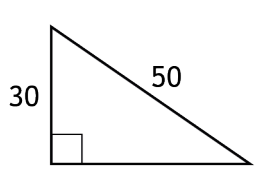
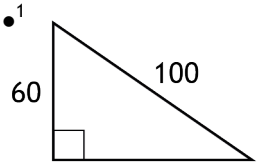
3. For the award of $\bullet^4$
   (a) Accept eg
   - On average the magazine readers are younger.

   (b) **Do not accept** eg
   - The **median** age of the magazine readers is less
   - The ages of the newspaper readers are more **(this implies that all ages are more)**
   - On average the newspaper readers' **results/scores/data** are higher.

4. For the award of $\bullet^5$
   (a) Accept eg
   - The spread of newspaper readers' ages is more.
   - The magazine readers' ages are less varied.

   (b) **Do not accept** eg
   - The **IQR** of the newspaper readers' ages is more.
   - The **range** of the magazine readers' ages is less.
   - **On average** the newspaper readers' ages are more varied.
   - The **IQR** of the newspaper readers' ages is less consistent.
   - The newspaper readers' **results/scores/data** are less consistent.

Commonly Observed Responses:

Question			Generic scheme	Illustrative scheme	Max mark
10.			**Method 1**	**Method 1**	**4**
			•[1] marshal facts and recognise right angled triangle	•[1] 	
			•[2] consistent Pythagoras statement	•[2] $50^2 - 30^2$	
			•[3] calculate third side	•[3] 40	
			•[4] calculate width	•[4] 90	
			Method 2	**Method 2**	
			•[1] marshal facts and recognise right angled triangle	•[1] 	
			•[2] consistent Pythagoras statement	•[2] $100^2 - 60^2$	
			•[3] calculate third side	•[3] 80	
			•[4] calculate width	•[4] 90	

Question	Generic scheme	Illustrative scheme	Max mark

10. (continued)

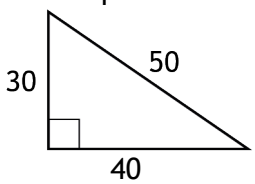
Notes:

1. Correct answer without working — award 0/4

2. In the absence of a diagram accept $50^2 - 30^2$ or $100^2 - 60^2$ as evidence for the award of $\bullet^1$ and $\bullet^2$.

3. **BEWARE**
   Where a diagram is shown, working must be consistent with the diagram; $\bullet^2$ is not available for an **incorrect** diagram leading to $50^2 - 30^2$ or $100^2 - 60^2$.

4. $\bullet^4$ is only available following a Pythagoras calculation within a **valid** right-angled triangle except in the examples outlined in note 5
   eg $d = 100 \rightarrow 100 - 60 = 40 \rightarrow 40 + 50 = 90$ — award 0/4

5. Where a candidate demonstrates recognition of 3,4,5 Pythagorean triple, for the award of $\bullet^1$, $\bullet^2$ and $\bullet^3$ accept:
   (a)
   

   (b) 40, since 3, 4, 5 triangle or Pythagorean triple.

6. Where a candidate uses 60 and 50 or 50 and 50 within a Pythagorean statement, $\bullet^1$ and $\bullet^4$ are not available eg
   (a) consistent with their diagram: $60^2 - 50^2 \rightarrow 10\sqrt{11} \rightarrow 50 + 10\sqrt{11}$ — award 2/4 ×✓1✓1×
   (b) no diagram: $60^2 - 50^2 \rightarrow 10\sqrt{11} \rightarrow 50 + 10\sqrt{11}$ — award 1/4 ××✓1×

7. Where a candidate's Pythagoras statement leads to an invalid solution, do not award $\bullet^3$ but $\bullet^4$ is still available eg $30^2 - 50^2 \rightarrow \sqrt{\pm 1600} \rightarrow 40 \rightarrow 90$ $\bullet^3$ × $\bullet^4$✓1

Commonly Observed Responses:

1. $40 \rightarrow 90$ — award 0/4 ^^^✓2

Question			Generic scheme	Illustrative scheme	Max mark
11.			$\bullet^1$ state value	$\bullet^1$ -0.5	**1**
Notes:					
Commonly Observed Responses:					
12.			**Method 1** $\bullet^1$ start to simplify (one correct application of law of indices) $\bullet^2$ complete simplification $\bullet^3$ express with a positive power **Method 2** $\bullet^1$ express with a positive power $\bullet^2$ start to simplify (one correct application of law of indices) $\bullet^3$ express with a positive power	$\bullet^1$ $\frac{5c^{-2}}{c^7}$ or $\frac{5c^{-5}}{c^4}$ or $\frac{5c^{-6}}{c^3}$ $\bullet^2$ $5c^{-9}$ $\bullet^3$ $\frac{5}{c^9}$ $\bullet^1$ $\frac{5}{c^3\times c^4\times c^2}$ $\bullet^2$ $\frac{5}{c^3\times c^6}$ or $\frac{5}{c^7\times c^2}$ stated or implied by $\bullet^3$ $\bullet^3$ $\frac{5}{c^9}$	**3**
Notes:					
1. Correct answer without working					award 3/3
Commonly Observed Responses:					
1. $\frac{5c^{-2}}{c^7}\to 5c^{-9}\to\frac{1}{5c^9}$					award 2/3 ✓✓×
2. (a) $\frac{5c^{-2}}{c^7}\to 5c^{-5}\to\frac{5}{c^5}$					award 2/3 ✓×✓1
(b) $\frac{5c^{-2}}{c^7}\to\frac{5}{c^5}$					award 1/3 ✓××
3. $\frac{5c^{-2}}{c^{12}}\left(\to 5c^{-14}\right)\to\frac{5}{c^{14}}$					award 2/3 ×✓1✓1
4. (a) $\frac{5c^{-2}}{c^{12}}\to 5c^{-10}\to\frac{5}{c^{10}}$					award 1/3 ××✓1
(b) $\frac{5c^{-2}}{c^{12}}\to\frac{5}{c^{10}}$					award 0/3

Question			Generic scheme	Illustrative scheme	Max mark
13.	(a)		•[1] state value of a	•[1] −30 or 330	**1**
Notes:					
1. For $y = \cos(x - 30) + \ldots$				award 1/1	
2. For $a = 1$ in (a) and $b = -30$ in (b)				award 0/1 in (a) and award 1/1 in (b)✓1	
Commonly Observed Responses:					
	(b)		•[2] state value of b	•[2] 1	**1**
Notes:					
1. For $y = \cos(x \pm \ldots) + 1$				award 1/1	
2. For $a = 1$ in (a) and $b = -30$ in (b)				award 0/1 in (a) and award 1/1 in (b)✓1	
Commonly Observed Responses:					

Question			Generic scheme	Illustrative scheme	Max mark
14.			**Method 1** •[1] eliminate denominators •[2] rearrange into the form $ax > b$ or $b > ax$ •[3] solve for x **Method 2** •[1] collect algebraic terms and express as a fraction in simplest form •[2] rearrange into the form $ax > b$ or $b > ax$ •[3] solve for x **Method 3** •[1] express left hand side as a fraction in simplest form •[2] rearrange into the form $ax > b$ or $b > ax$ •[3] solve for x	**Method 1** •[1] $5(x+1)-30 > 9x$ or equivalent •[2] $-4x > 25$ or $-25 > 4x$ •[3] $x < -\frac{25}{4}$ or $-\frac{25}{4} > x$ **Method 2** •[1] $\frac{5-4x}{15} > 2$ or equivalent •[2] $-4x > 25$ or $-25 > 4x$ •[3] $x < -\frac{25}{4}$ or $-\frac{25}{4} > x$ **Method 3** •[1] $\frac{x-5}{3} > \frac{3x}{5}$ or equivalent •[2] $-4x > 25$ or $-25 > 4x$ •[3] $x < -\frac{25}{4}$ or $-\frac{25}{4} > x$	**3**

Question	Generic scheme	Illustrative scheme	Max mark

14. (continued)

Notes:

1. Correct answer without working — award 0/3
   Treat repeated substitution as invalid working.
2. For the award of •³ accept eg $x < -6\frac{1}{4}$, $-6.25 > x$, $x < \frac{25}{-4}$
3. For the award of •³ the answer must be a non-integer value.
   Do not award •³ for a decimal approximation of $-\frac{25}{4}$, but do not penalise incorrect conversion to a mixed number or decimal approximation following an answer of $-\frac{25}{4}$

   (a) $5(x+1)-30>9x \rightarrow -4x>25 \rightarrow x<-\frac{25}{4} \rightarrow x<-6.3$ — award 3/3

   (b) $5(x+1)-30>9x \rightarrow -4x>25 \rightarrow x<-6.3$ — award 2/3 ✓✓×

4. (a) There must be evidence that the candidate has dealt with the negative coefficient of x on the LHS of the inequation by either:
   (i) reversing the direction of the inequality sign at •³
   eg $5(x+1)-30>9x \rightarrow -4x>25 \rightarrow x<-\frac{25}{4}$ — award 3/3

   OR

   (ii) collecting the x term(s) on the RHS of the inequation at •²
   eg $5(x+1)-30>9x \rightarrow -25>4x \rightarrow -\frac{25}{4}>x$ — award 3/3

   (b) Where a candidate requires to do neither of the above, then •³ does not gain a mark

   eg $5(x+1)-30>9x \rightarrow 4x>25 \rightarrow x>\frac{25}{4}$ — award 1/3 ✓×✓2

5. For subsequent incorrect working •³ is not available
   eg $-\frac{25}{4}>x \rightarrow x>-\frac{25}{4}$ — award 2/3 ✓✓×

Commonly Observed Responses:

1. $5(x+1)-2>9x \rightarrow -4x>-3 \rightarrow x<\frac{3}{4}$ — award 2/3 ×✓1✓1
2. (a) $5(x+1)-30=9x \rightarrow -4x=25 \rightarrow x=-\frac{25}{4} \rightarrow x<-\frac{25}{4}$ — award 3/3

   (b) $5(x+1)-30=9x \rightarrow -4x=25 \rightarrow x=-\frac{25}{4}$ — award 2/3 ✓✓×

[END OF MARKING INSTRUCTIONS]