National Qualifications 2025

2025 Mathematics

National 5 – Paper 1

Question Paper Finalised Marking Instructions

These marking instructions have been prepared by examination teams for use by SQA appointed markers when marking external course assessments.

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.

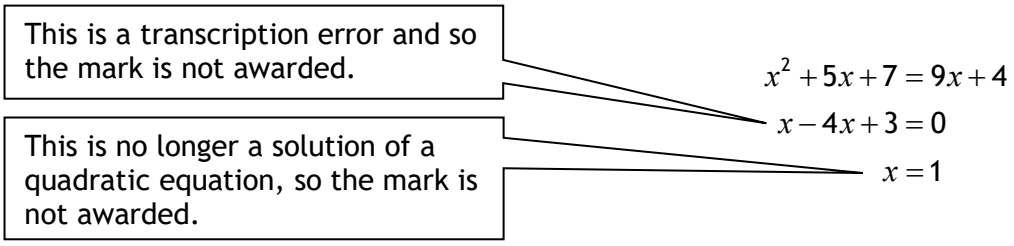
(d) If a candidate's response contains an error, all working subsequent to this error must still be marked. Only award marks if the level of difficulty in their working is similar to the level of difficulty in the illustrative scheme.

(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.

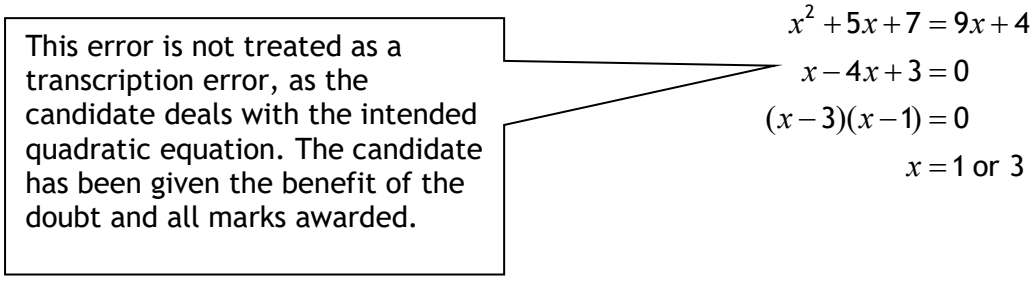
(f) Candidates may use any mathematically correct method to answer questions, except in cases where a particular method is specified or excluded.

(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:

	O^5	O^6
O^5	$x=2$	$x=-4$
O^6	$y=5$	$y=-7$

Horizontal: O^5 $x=2$ and $x=-4$ Vertical: O^5 $x=2$ and $y=5$
O^6 $y=5$ and $y=-7$ O^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 $1\frac{1}{4}$ $\frac{43}{1}$ must be simplified to 43

$\frac{15}{0{\cdot}3}$ 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 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 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.

Note: Marking from Image (MFI) annotation change from 2025

A double cross-tick is used to indicate correct working which is irrelevant or insufficient to score any marks. In MFI marking instructions prior to 2025 this was shown as **ü₂** or ü2.

From 2025, the double cross-tick will no longer be used in MFI. A cross or omission symbol will be used instead.

Marking Instructions for each question

Question	Generic scheme	Illustrative scheme	Max mark
1.	$\bullet^1$ start to multiply fractions	$\bullet^1$ $\frac{14}{5}\times\frac{2}{7}$	**2**
	$\bullet^2$ consistent answer in simplest form	$\bullet^2$ $\frac{4}{5}$	

Notes:

1. Correct answer without working. award 0/2
2. $\bullet^2$ is only available where simplifying is required.
3. For subsequent incorrect working, $\bullet^2$ is not available.

   eg $\frac{14}{5}\times\frac{2}{7}=\frac{4}{5}\rightarrow 1\frac{1}{5}$ award 1/2 ✓×

Commonly Observed Responses:

1. $\frac{14}{5}\times\frac{2}{7}=\frac{28}{35}$ award 1/2 ✓×
2. $\frac{14}{5}\times\frac{7}{2}\rightarrow\frac{49}{5}$ or $9\frac{4}{5}$ award 1/2×✓1
3. $\frac{14}{5}\times\frac{7}{2}\rightarrow\frac{98}{10}$ or $9\frac{8}{10}$ award 0/2
4. (a) $\frac{14}{5}\times\frac{2}{7}\rightarrow\frac{98}{35}+\frac{10}{35}=\frac{108}{35}\left(=3\frac{3}{35}\right)$ award 1/2 ✓×

   (b) $\frac{14}{5}+\frac{2}{7}\rightarrow\frac{98}{35}+\frac{10}{35}=\frac{108}{35}\left(=3\frac{3}{35}\right)$ award 0/2

Question	Generic scheme	Illustrative scheme	Max mark
2.	$\bullet^1$ expand pair of brackets $\bullet^2$ complete expansion $\bullet^3$ collect like terms (see note 3)	$\bullet^1$ $x^2+5x+3x+15$ $\bullet^2$ $\ldots+4x-8$ $\bullet^3$ $x^2+12x+7$	**3**

Notes:

1. Correct answer without working. award 3/3
2. For the award of $\bullet^2$ do **not** accept $4x-8$ on its own or $(x+3)(x+5)+4x-8$.
3. For the award of $\bullet^3$ the candidate's evidence must include both:
   (a) an x^2 term or higher power.
   (b) the collection of constants **and** x terms (or higher powers of x due to incorrect expansion).
4. For subsequent incorrect working $\bullet^3$ is not available.
5. Evidence of $\bullet^1$ and $\bullet^2$ may appear in a grid.

Commonly Observed Responses:

1. $x^2+5x+3x+8+4x-8 \rightarrow x^2+12x$ award 2/3 ×✓✓1
2. $x^2+15+4x-8 \rightarrow x^2+4x+7$ award 1/3 ×✓×

Question			Generic scheme	Illustrative scheme	Max mark
3.			•1 find quartiles •2 calculate IQR	•1 13, 18 •2 5	2

Notes:

1. Correct answer without working. award 0/2
2. Accept quartiles indicated on the list or on a diagram for •1.
3. Where a candidate calculates the range, award marks as follows:
   (a) quartiles = 13 and 18 IQR = 22 – 3 = 19. award 1/2 ✓×
   (b) $Q_1 = 3$ and $Q_3 = 22$ (**clearly** labelled as Q_1 and Q_3) IQR = 22 – 3 = 19. award 1/2 ×✓1
   (c) IQR = 22 – 3 = 19. award 0/2
4. Where a candidate has calculated SIQR = 2.5, •2 can only be awarded where the candidate has **explicitly** stated "IQR = 5".
   eg (a) quartiles = 13 and 18, IQR = 5, SIQR = 2.5 award 2/2
   (b) quartiles = 13 and 18 → (IQR =) 2.5 award 1/2 ✓×
5. Where a candidate has calculated the IQR, but stated SIQR = 5, •2 is available.
   eg quartiles = 13 and 18, SIQR = 5 award 2/2
6. For •2 do not accept a negative IQR.
   eg IQR = 13 – 18 = –5 award 1/2 ✓×
7. Where IQR is incorrect, •2 is only available for a subtraction of numbers identified as quartiles.
   eg IQR = 19 – 11 = 8 award 0/2 ××

Commonly Observed Responses:

1. IQR = 18 – 13 = 5 → 2.5 award 1/2 ✓×
2. quartiles = 12 and 18.5 IQR = 18.5 – 12 = 6.5 award 1/2 ×✓1
3. quartiles = 14 and 17.5 IQR = 17.5 – 14 = 3.5 award 1/2 ×✓1

Question	Generic scheme	Illustrative scheme	Max mark
4.	•1 evidence that $80\% = 720$	•1 $80\% = 720$	**3**
	•2 start valid strategy	•2 $(1\% =)\ \frac{720}{80}$ **OR** $(10\% =)\ \frac{720}{8}$ **OR** $(20\% =)\ \frac{720}{4}$ or equivalent	
	•3 complete calculation within a valid strategy	•3 (£)900	

Notes:

1. Correct answer without working. award 0/3
2. (a) $80\% = 720 \rightarrow 80\%$ of $720 = 576$. award 1/3 ✓××
   (b) 80% of $720 = 576$. award 0/3
3. (a) $80\% = 720 \rightarrow 120\%$ of $720 = 864$. award 1/3 ✓××
   (b) 120% of $720 = 864$. award 0/3
4. (a) $80\% = 720 \rightarrow 20\%$ of $720 = 144$. award 1/3 ✓××
   (b) 20% of $720 = 144$. award 0/3

Commonly Observed Responses:

1. $\frac{720}{0.8} = 900$ award 3/3
2. (a) For $120\% = 720 \rightarrow (1\% =)\ \frac{720}{120} \rightarrow 600$ award 2/3 ×✓1✓1
   (b) For $120\% = 720 \rightarrow (1\% =)\ \frac{720}{120}$ or $(10\% =)\ \frac{720}{12}$ or $(20\% =)\ \frac{720}{6}$ award 1/3 ×✓1^
3. $20\% = 720 \rightarrow 100\% = 3600$ award 1/3 ×✓1×

Question	Generic scheme	Illustrative scheme	Max mark
5.	•1 substitute correctly into area formula •2 calculate area	•1 $\frac{1}{2}\times 6\times 6\times \frac{2}{3}$ •2 12 (cm^2)	**2**

Notes:

1. Correct answer without working. award 0/2
2. (a) $\frac{1}{2}\times 6\times 6\times \cancel{\sin}\ \frac{2}{3}=18\times \cancel{\sin}\ \frac{2}{3}=12$
   where sin is scored out in **each line** of working. award 2/2
   (b) $\frac{1}{2}\times 6\times 6\times \sin\frac{2}{3}=12$ award 1/2 ×✓
   (c) $\frac{1}{2}\times 6\times 6\times \sin\frac{2}{3}$ award 0/2 ×^
3. Do not award •2 for a **correct** substitution of $\frac{2}{3}$ converted to a decimal approximation or truncation.
   eg (a) $\frac{1}{2}\times 6\times 6\times \frac{2}{3}\ \rightarrow \frac{1}{2}\times 6\times 6\times 0.66\ldots=12$ award 2/2
   (b) $\frac{1}{2}\times 6\times 6\times \frac{2}{3}\ \rightarrow \frac{1}{2}\times 6\times 6\times 0.67=12.06$ award 1/2 ✓×
4. Do not award •1 for a decimal approximation or truncation of $\frac{2}{3}$.
   However •2 can be awarded for a consistent calculation provided given answer rounds to 12.
   eg (a) (i) $\frac{1}{2}\times 6\times 6\times 0.67=12.06$ award 1/2 ×✓1
   (ii) $\frac{1}{2}\times 6\times 6\times 0.66=11.88$ award 1/2 ×✓1
   (b) (i) $\frac{1}{2}\times 6\times 6\times 0.7=12.6$ award 0/2
   (ii) $\frac{1}{2}\times 6\times 6\times 0.6=10.8$ award 0/2

Commonly Observed Responses:

1. $\frac{1}{2}\times 6\times 6\times \sin\frac{2}{3}\rightarrow \sin 12$ award 0/2 ××
2. $\frac{1}{2}\times 6\times \frac{2}{3}\rightarrow 2$ award 1/2 ×✓1
3. $\frac{1}{2}\times 6\times 6=18$ award 0/2 ××
4. $\frac{1}{2}\times 6\times 6\times 0.66\ldots=12$ or $\frac{1}{2}\times 6\times 6\times 0.\dot{6}=12$ award 2/2
5. $\frac{1}{2}ab\sin\frac{2}{3}\rightarrow \frac{1}{2}\times 6\times 6\times \frac{2}{3}\rightarrow 12$ award 2/2

Question	Generic scheme	Illustrative scheme	Max mark
6.	**Method 1:** $y-b=m(x-a)$		**3**
	$\bullet^1$ calculate gradient	$\bullet^1$ $-\frac{10}{5}$ or equivalent	
	$\bullet^2$ substitute gradient and a point into $y-b=m(x-a)$	$\bullet^2$ eg $y-12=-\frac{10}{5}(x-1)$ **OR** $y-2=-\frac{10}{5}(x-6)$	
	$\bullet^3$ state equation in simplest form	$\bullet^3$ $y=-2x+14$ or equivalent	
	Method 2: $y=mx+c$		
	$\bullet^1$ calculate gradient	$\bullet^1$ $-\frac{10}{5}$ or equivalent	
	$\bullet^2$ substitute gradient and a point into $y=mx+c$	$\bullet^2$ eg $12=\left(-\frac{10}{5}\right)\times 1+c$ **OR** $2=\left(-\frac{10}{5}\right)\times 6+c$	
	$\bullet^3$ state equation in simplest form	$\bullet^3$ $y=-2x+14$ or equivalent	

Notes:

1. Correct answer without working. award 0/3
2. For an incorrect simplification of a gradient, a mark is not awarded at the point where the error occurs.

   eg (a) $-\frac{10}{5}(=2)\rightarrow 12=2\times 1+c\rightarrow y=2x+10$ award 2/3 ✓×✓1

   (b) $-\frac{10}{5}\rightarrow 12=-\frac{10}{5}\times 1+c\rightarrow y=2x+10$ award 2/3 ✓✓×
3. For subsequent incorrect working, $\bullet^3$ is not available.

Commonly Observed Responses:

1. $\left(-\frac{5}{10}=\right)-\frac{1}{2}\rightarrow 1=\left(-\frac{1}{2}\right)\times 12+c\rightarrow y=-\frac{1}{2}x+7$ award 2/3 ×✓1✓1

2. $\left(-\frac{10}{5}=\right)-2\rightarrow 12=-2\times 1+c\ \rightarrow\ y=-2x+10$ or $y=-2x-10$ award 2/3 ✓✓×

3. $y-b=m(x+a)\rightarrow y-2=-\frac{10}{5}(x+6)\rightarrow y=-2x-10$ award 2/3 ✓×✓1

Question			Generic scheme	Illustrative scheme	Max mark
7.	(a)		•1 state the value of $f(6)$	•1 25	**1**
Notes:					
Commonly Observed Responses:					
	(b)		•2 valid strategy •3 state value of p	•2 $3p+7=19$ •3 $(p=)4$	**2**

Notes:

1. Correct answer without working. award 2/2
2. For $f(4)=19$ or $f(4)$ (no working necessary) . award 2/2
3. For the award of •2 accept $3\times4+7=19$.
   However, for the award of •3 the value of p must be clearly indicated.
4. Accept use of x in place of p.
5. For the award of •3 the use of 19 must be evident or implied.

Commonly Observed Responses:

1. $3\times19+7=64$ award 0/2 ××
2. (a) $3p+7=19$ or $3\times4+7=19\rightarrow p=4\rightarrow f(p)=4$ award 2/2
   (b) $3p+7=19$ or $3\times4+7=19\rightarrow f(p)=4$ award 1/2 ✓×
3. $f(19)=3x+7\rightarrow19-7=3x\rightarrow12=3x\rightarrow x=4$ award 2/2

Question	Generic scheme	Illustrative scheme	Max mark
8.	•1 state x–coordinate or y–coordinate •2 state x–coordinate and y–coordinate	•1 $(120,\ldots)$ or $(\ldots,2)$ •2 $(120,2)$	**2**

Notes:

1. For $x=120$, $y=2$ **.** award 2/2

2. •1 is not available where brackets are omitted unless answer is in the form shown in Note 1.
   (a) 120,2 award 1/2 ×✓1
   (b) 30,2 award 0/2 ××

Commonly Observed Responses:

1. (a) $(2,\ 120)$ or $x=2,\ y=120$ award 1/2 ×✓1
   (b) 2, 120 award 0/2 ××
2. (a) $(30,\ 2)$ or $x=30,\ y=2$ award 1/2 ✓×
   (b) $(2,\ 30)$ or $x=2,\ y=30$ award 0/2 ××
3. 2 or A = 2 award 0/2

Question			Generic scheme	Illustrative scheme	Max mark
9.	(a)		$\bullet^1$ state the value of a	$\bullet^1$ 3	**1**

Notes:

1. For $[y=](x+3)^2\ldots.$ award 1/1 ✓
2. (a) Where a candidate states an incorrect equation and states $a=3$. award 1/1 ✓
   (b) Where a candidate states $[y=](x+3)^2\ldots$ and states an incorrect value of a. award 0/1 ×
3. If $[y=](x+3)^2\ldots$ appears in (b) award $\bullet^1$.
   However, do not award $\bullet^1$ if a different value for a is stated in (a).

Commonly Observed Responses:

	(b)		$\bullet^2$ state the value of b	$\bullet^2$ -5	**1**

Notes:

1. For $[y=](x\ldots)^2-5$. award 1/1 ✓
2. For an answer of $a=-5$ in (a) and $b=3$ in (b). award 0/1 for (a) × and 1/1 for (b) ✓1
3. (a) Where a candidate states an incorrect equation and states $b=-5$. award 1/1 ✓
   (b) Where a candidate states $[y=](x\ldots)^2-5$ and states an incorrect value of b. award 0/1 ×
4. If $[y=](x\ldots)^2-5$ appears in (a) award $\bullet^2$.
   However, do not award $\bullet^2$ if a different value for b is stated in (b).

Commonly Observed Responses:

Question	Generic scheme	Illustrative scheme	Max mark
10.	•1 apply $\left(x^a\right)^b = x^{a\times b}$ •2 apply $x^m \times x^n = x^{m+n}$ •3 apply $\frac{x^p}{x^q} = x^{p-q}$	•1 n^6 •2 n^{13} •3 n^9	**3**

Notes:

1. Correct answer without working. award 0/3
2. For subsequent incorrect working •3 is not available.
   eg $\frac{n^7 \times n^6}{n^4} \rightarrow \frac{n^{13}}{n^4} \rightarrow n^9 \rightarrow \frac{1}{n^9}$ award 2/3 ✓✓×

Commonly Observed Responses:

1. $\frac{n^7 \times n^5}{n^4} \rightarrow \frac{n^{12}}{n^4} \rightarrow n^8$ award 2/3 ×✓1✓1
2. $\frac{n^7 \times n^9}{n^4} \rightarrow \frac{n^{16}}{n^4} \rightarrow n^{12}$ award 2/3 ×✓1✓1
3. $\frac{n^7 \times n^6}{n^4} \rightarrow \frac{n^{42}}{n^4} \rightarrow n^{10.5}$ award 1/3 ✓××

Question	Generic scheme	Illustrative scheme	Max mark
11.	$\bullet^1$ calculate discriminant $\bullet^2$ state nature of roots	$\bullet^1$ -8 $\bullet^2$ no real roots	**2**

Notes:

1. Correct answer without working. award 0/2
2. (a) For $4-12<0 \rightarrow$ no real roots. award 2/2
   (b) For $4-12 \rightarrow$ no real roots. award 0/2 ××
3. For the award of $\bullet^2$ do not accept:
   (a) "No roots".
   (b) "No **distinct** real roots" or "No **distinct** roots".
   (c) "No **equal** real roots" or "No **equal** roots".
4. Expected answers for the award of $\bullet^2$, when
   (a) $b^2-4ac>0$: "2 distinct real roots" or "2 unequal real roots". award 1/2 ×✓1
   (b) $b^2-4ac=0$: "1 repeated real root" or "2 equal real roots". award 1/2 ×✓1
5. Accept $\sqrt{-8}$ as evidence for $\bullet^1$ in a quadratic formula or alone.

Commonly Observed Responses:

1. $-8>0 \rightarrow$ No real roots award 1/2 ✓×

Question			Generic scheme	Illustrative scheme	Max mark
12.			$\bullet^1$ express as equivalent fraction with rational denominator $\bullet^2$ express in simplest form	$\bullet^1$ $\frac{6\sqrt{10}}{10}$ $\bullet^2$ $\frac{3\sqrt{10}}{5}$	**2**

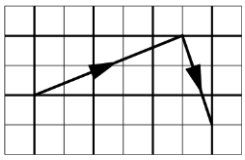
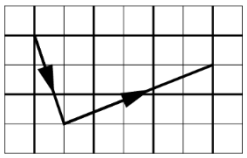
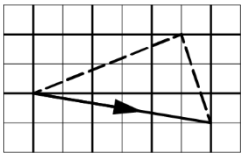
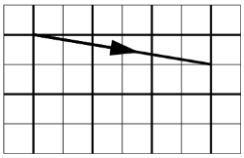
Notes:

1. Correct answer without working. award 0/2
2. For the award of $\bullet^2$ accept $0.6\sqrt{10}$ or $\frac{3\times\sqrt{10}}{5}$
3. For subsequent incorrect working, $\bullet^2$ is not available.
   eg $\frac{6\sqrt{10}}{10} \rightarrow \frac{3\sqrt{10}}{5} \rightarrow \frac{3\sqrt{2}}{5}$ award 1/2 ✓×
4. $\bullet^2$ may only be awarded if the denominator is rational and the numerator includes a surd.

Commonly Observed Responses:

1. $\frac{6\sqrt{10}}{10} \rightarrow \frac{3\sqrt{5}}{5}$ award 1/2 ✓×

2. $\frac{\sqrt{2}\sqrt{3}}{\sqrt{2}\sqrt{5}} \rightarrow \frac{\sqrt{3}}{\sqrt{5}}$ award 0/2

Question	Generic scheme	Illustrative scheme	Max mark
13.	**Method 1**		**2**
	•[1] correct nose-to-tail diagram	•[1]  **OR** 	
	•[2] consistent vector $\mathbf{p}+\mathbf{q}$ drawn (must include arrow)	•[2] 	
	Method 2		
	•[1] find components of $\mathbf{p}+\mathbf{q}$	•[1] $\begin{pmatrix} 6 \\ -1 \end{pmatrix}$	
	•[2] consistent vector $\mathbf{p}+\mathbf{q}$ drawn (must include arrow)	•[2] 	

Question	Generic scheme	Illustrative scheme	Max mark

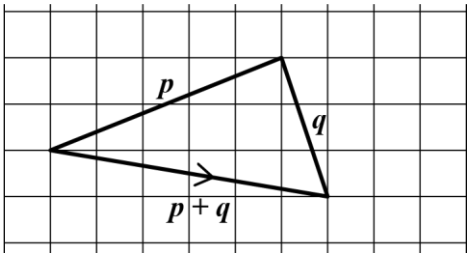
13. (continued)

Notes:

1. Correct answer without working. award 2/2
2. In method 1 the arrows must be included in the nose to tail diagram for the award of $\bullet^1$, unless implied by an arrow on the correct resultant vector.
3. In method 2 the brackets are not required for the award of $\bullet^1$ but do **not** accept (6,–1) alone.
4. Do NOT penalise vectors drawn without a ruler provided the start and end points are accurate.
5. Where there is evidence of component form and a nose-to-tail diagram, mark both methods and award the higher mark (apply general marking principle (p)).

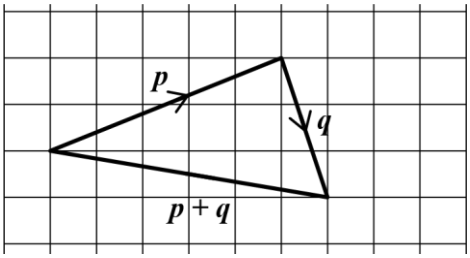
Commonly Observed Responses:

1. (a)



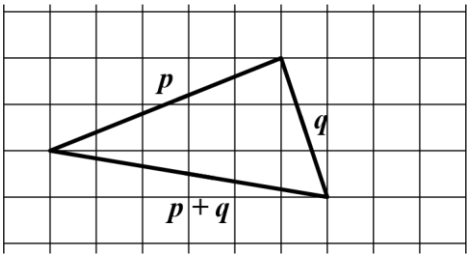
award 2/2

(b)



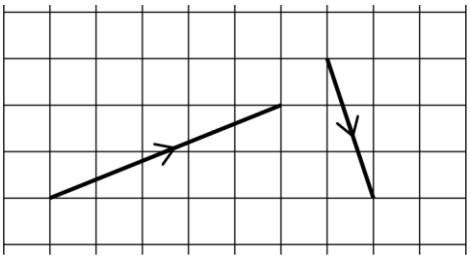
award 1/2 ✓×

(c)



award 0/2 ××

2.



award 0/2 ××

Question			Generic scheme	Illustrative scheme	Max mark
14.			•1 correct denominator •2 correct numerator •3 remove brackets and collect like terms in numerator	•1 $\frac{\ldots}{x(x-1)}$ •2 $\frac{5x-4(x-1)}{\ldots}$ •3 $\frac{x+4}{x(x-1)}$	3

Notes:

1. Correct answer without working. award 3/3
2. Accept $\frac{5x}{x(x-1)}-\frac{4(x-1)}{x(x-1)}$ for the award of •1 and •2.
3. Where a candidate chooses to expand the brackets in the denominator, then •3 is only available for a correct expansion.

   eg (a) $\frac{5x}{x(x-1)}-\frac{4(x-1)}{x(x-1)}=\frac{x+4}{x^2-x}$ award 3/3

   (b) $\frac{5x}{x(x-1)}-\frac{4(x-1)}{x(x-1)}=\frac{x+4}{x^2-1}$ award 2/3 ✓✓×

   (c) $\frac{5x}{x^2-1}-\frac{4(x-1)}{x^2-1}=\frac{x+4}{x^2-1}$ award 2/3

   ×✓✓1
4. For subsequent incorrect working, the final mark is not available.

   eg $\frac{x+4}{x(x-1)}=\frac{1+4}{x-1}=\frac{5}{x-1}$ award 2/3 ✓✓×

Commonly Observed Responses:

1. $\frac{5x}{x(x-1)}-\frac{4x-1}{x(x-1)}=\frac{x+1}{x(x-1)}$ award 1/3 ✓××
2. (a) $\frac{5x}{x(x-1)}-\frac{4x-1}{x(x-1)}=\frac{x-1}{x(x-1)}$ award 1/3 ✓××

   (b) $\frac{5x-4x-1}{x(x-1)}=\frac{x-1}{x(x-1)}$ award 1/3 ✓××
3. (a) $\frac{5x}{x(x-1)}-\frac{4x-4}{x(x-1)}=\frac{x-4}{x(x-1)}$ award 2/3 ✓✓×

   (b) $\frac{5x}{x(x-1)}-\frac{4(x-1)}{x(x-1)}=\frac{5x-4x-4}{x(x-1)}=\frac{x-4}{x(x-1)}$ award 2/3 ✓✓×

   (c) $\frac{5x-4x-4}{x(x-1)}=\frac{x-4}{x(x-1)}$ award 2/3 ✓×✓1
4. $5x-4(x-1)$ award 0/3

Question			Generic scheme	Illustrative scheme	Max mark
15.	(a)		•[1] find expression for area of rectangle	•[1] $(2x+3)(x+1)$ or equivalent	**1**

Notes:

1. If no expression is given in (a) but appears in (b) or (c). award 1/1
2. (a) accept $(2x+3)\times(x+1)$ or $2x+3\times x+1$.
   (b) do NOT accept $2x+3\times(x+1)$ or $(2x+3)\times x+1$ unless the correct expansion appears in parts (a), (b) or (c).
3. Do not penalise incorrect simplification or expansion of brackets in (a).

Commonly Observed Responses:

	(b)		•[2] equate required expressions **and** expand expression for area of square **or** rectangle **within** the equation •[3] complete expansion and rearrange into required form	•[2] $2x^2+2x+3x+3=(x+3)^2$ **OR** $(2x+3)(x+1)=x^2+3x+3x+9$ •[3] $2x^2+2x+3x+3=x^2+3x+3x+9$ $\Rightarrow x^2-x-6=0$	**2**

Notes:

1. If solution to (b) appears in (a) or (c) then both marks are available.

Commonly Observed Responses:

Question			Generic scheme	Illustrative scheme	Max mark
15.	(c)		•[4] factorise x^2-x-6 •[5] solve equation •[6] reject invalid value of x and state length and breadth of rectangle	•[4] $(x-3)(x+2)$ •[5] $(x=)3, (x=)-2$ •[6] 9 (cm) and 4(cm)	**3**

Notes:

1. Correct answer without working. award 0/3
2. If solution to (c) appears in (a) or (b) then all three marks are available. However, if a different value for x is stated in (c) then •[6] is not available. (General Marking Principle (l) should not be applied in this special case.)
3. •[4] is available for $\frac{1\pm\sqrt{25}}{2}$.
4. For an answer obtained by repeated substitution. award 0/3

Commonly Observed Responses:

1. (a) $(2x+3)(x+1)=0 \rightarrow x=-\frac{3}{2}, x=-1$ award 1/3 ×✓1×

   (b) $x=-\frac{3}{2}, x=-1$ without factorised quadratic equation stated award 0/3

[END OF MARKING INSTRUCTIONS]

