FOR OFFICIAL USE

N5

Teisteanais
Nàiseanta
EISIMPLEIR A-MHÀIN

Comharra

S873/75/01

Gnìomhachas Matamataig
Pàipear 1 (Gun Àireamhair)

Deit – Gun bhuinteanas

Ùine – 50 mionaid

* S 8 7 3 7 5 0 1 *

Lìon na bogsaichean seo agus leugh na tha air a chlò-bhualadh gu h-ìosal.

Làn ainm na sgoile no colaiste

Baile

Ciad ainm(ean)

Sloinneadh

Àireamh an t-suidheachain

Latha-breith

Latha | Mìos | Bliadhna

Àireamh an oileanaich

Comharran gu lèir — 35

Feuch na ceistean UILE.

CHAN FHAOD thu àireamhair a chleachdadh.

Gus na comharran gu lèir fhaighinn, feumaidh tu d' obrachadh a-mach a shealltainn sna freagairtean agad.

Cuir na h-aonadan anns na freagairtean agad far a bheil sin iomchaidh.

Sgrìobh do fhreagairtean gu soilleir anns na beàrnan san leabhran seo. Tha àite a bharrachd airson fhreagairtean aig deireadh an leabhrain seo. Ma chleachdas tu an t-àite seo, feumaidh tu àireamh na ceiste a tha thu a' freagairt a chomharrachadh gu soilleir.

Cleachd inc **gorm** no **dubh**.

Mus fàg thu seòmar na deuchainne feumaidh tu an leabhran seo a thoirt don Fhreiceadan; mura dèan thu sin, dh'fhaodadh tu na comharran gu lèir airson a' phàipeir seo a chall.

SQA ©

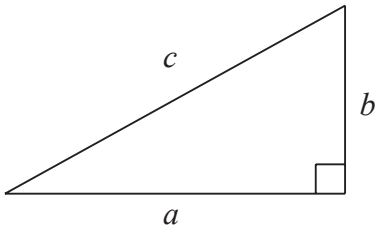
* S 8 7 3 7 5 0 1 0 1 *

LIOSTA FHOIRMLEAN

Cearcall-thomhas cearcaill $C = \pi d$

Farsaingeachd cearcaill $A = \pi r^2$

Teoram Pythagoras



$a^2 + b^2 = c^2$

Tomhas-lìonaidh siolandair $V = \pi r^2 h$

Tomhas-lìonaidh prìosaim $V = Ah$

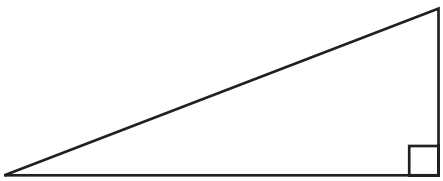
Tomhas-lìonaidh còin $V = \frac{1}{3}\pi r^2 h$

Tomhas-lìonaidh cruinne $V = \frac{4}{3}\pi r^3$

Claonadh àbhaisteach $s = \sqrt{\frac{\Sigma(x-\overline{x})^2}{n-1}}$

no $s = \sqrt{\frac{\Sigma x^2 - \frac{(\Sigma x)^2}{n}}{n-1}}$, far as e n meud an taghaidh.

Caisead



$$\text{caisead} = \frac{\text{àirde bheartagail}}{\text{astar còmhnard}}$$

Comharran gu lèir — 35

Feuch na ceistean UILE

1. Bidh Eilidh a' dèanamh agus a' reic choinnlean.

Bu chòir na coinnlean sin a bhith 22.5 cm a dh'àirde.

Bidh i a' diùltadh coinneal sam bith a tha taobh a-muigh raon $\pm$2 mm den àirde seo.

Gu h-ìosal tha àirdean, ann an ceudameatairean, de 10 coinnlean air an taghadh air thuaiream.

22.2, 22.6, 22.5, 22.9, 22.3, 21.6, 22.6, 22.4, 22.7, 22.8

Obraich a-mach an àireamh sa cheud de choinnlean a dhiùltas i. **3**

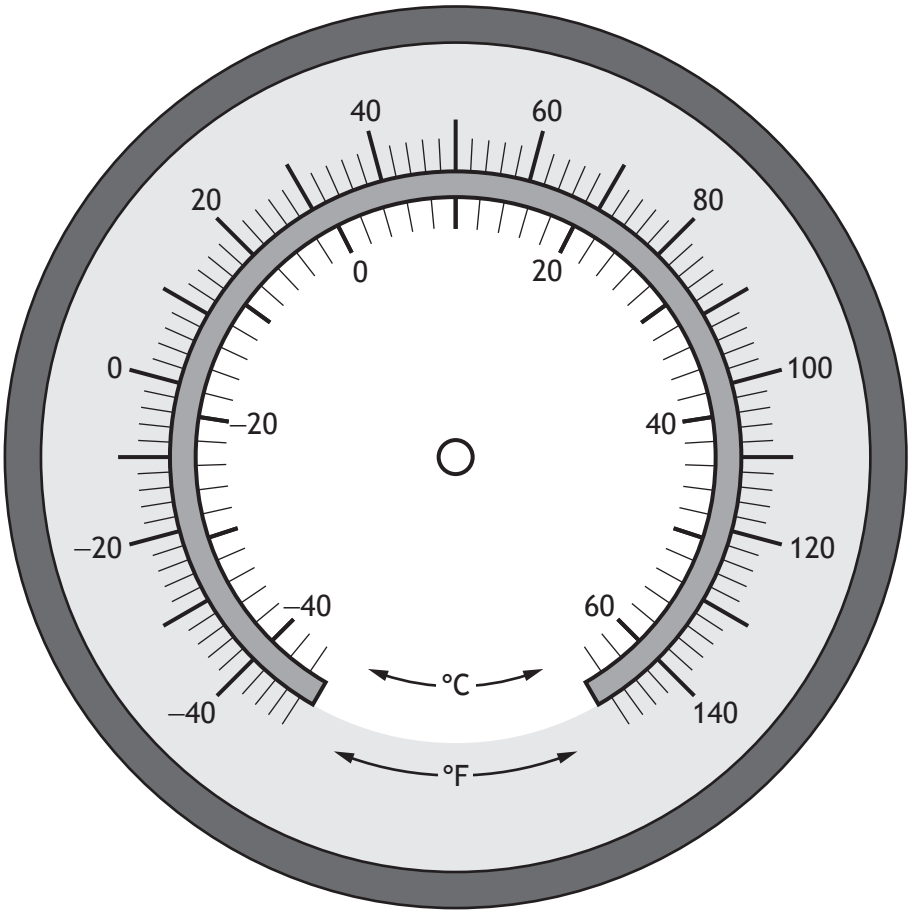
[Tionndaidh an duilleag

2. Tha Lynn ag itealaich air itealan agus chaidh innse dha gu bheil an teòthachd a-muigh 34 °C nas ìsle na teòthachd na talmhainn.

Is e teòthachd na talmhainn 6 °C.

Obraich a-mach an teòthachd a-muigh agus comharraich e air an t-slat-tomhais gu h-ìosal. **2**

(Gheibh thu tomhaisear a bharrachd, ma tha feum air, air *duilleag 15*.)



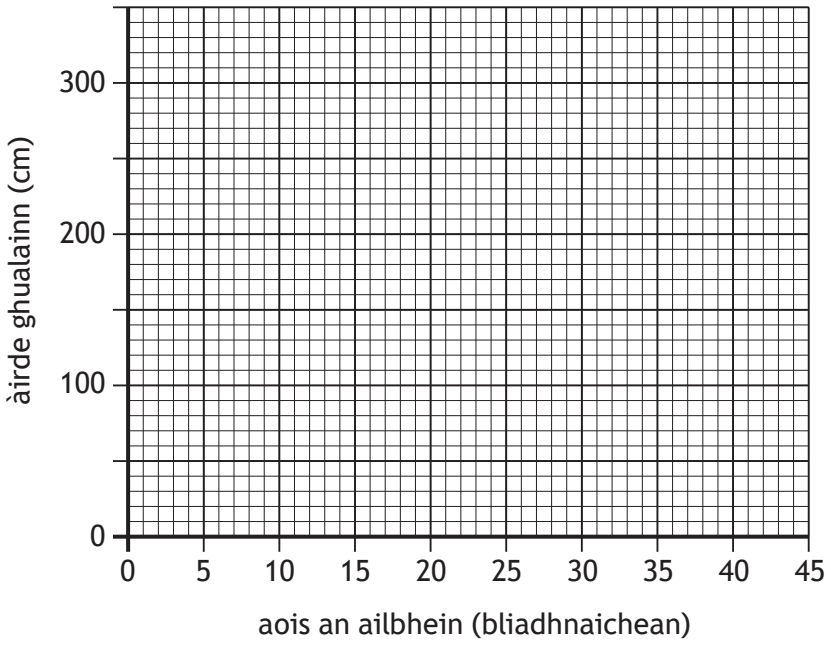
3. Bidh ailbhean Afraganach a' sìor fhàs fad am beatha.

Tha an clàr gu h-ìosal a' sealltainn aois sampall de ailbhein Afraganach agus àirdean nan guailnean.

Aois an ailbhein (bliadhnaichean)	12	17	28	35	43
Àirde ghualainn (cm)	230	250	270	275	300

(a) Air a' ghriod gu h-ìosal tarraing graf-sgapte gus an dàta seo a shealltainn. **2**

(Gheibh thu cliath a bharrachd, ma tha feum air, air *duilleag 16*.)



(b) Tarraing an loidhne as freagarraiche air do ghraf-sgapte. **1**

(c) Cleachd an loidhne as freagarraiche agad gus tuairmse a dhèanamh air aois ailbhean Afraganach aig a bheil àirde gualainn 260 cm. **1**

[Tionndaidh an duilleag

4. Cheannaich Bryan, Jamie agus Jessica **dà** phiotsa meadhanach eatorra.

- Dh'ith Bryan $\frac{5}{7}$ piotsa.
- Dh'ith Jamie $\frac{2}{3}$ piotsa.
- Dh'ith Jessica an còrr.

Obraich a-mach an àireamh iomlan de phiotsa a dh'ith Jessica. **3**
Thoir do fhreagairt mar bloigh de phiotsa.

5. Chaidh Steven air itealan gu Hong Kong airson obair ùr a thòiseachadh.
Bha an turas-adhair a' toirt a-steach stad ann an Doha.
Chaidh e à Dùn Èideann gu Doha agus an uairsin bho Doha gu Hong Kong.

- Thug an itealan bho Dhùn Èideann gu Doha 6 uairean 35 mionaidean.
- Thug an itealan bho Doha gu Hong Kong 7 uairean 20 mionaidean.
- Tha Hong Kong 8 uairean air thoiseach air Dùn Èideann.

Dh'fhalbh itealan Steven à Dùn Èideann aig 9:15 m àm ionadail.
Thàinig e air tìr ann an Hong Kong aig 8:50 m àm ionadail.
Dè cho fada 's a bha an stad ann an Doha? **3**

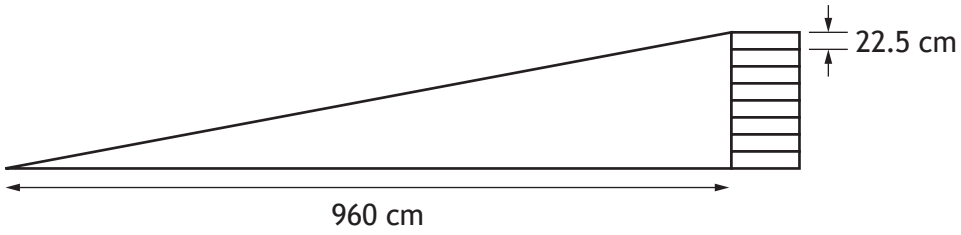
[Tionndaidh an duilleag

6. Tha leathad aig Iain sa ghàrradh cùil aige.

Is e àirde an leathad 8 bùird.

Tha àirde gach bòrd 22.5 cm.

Tha na bùird 960 cm air falbh bho bhonn an leathad.



(a) Obraich a-mach caisead an leathad. **2**

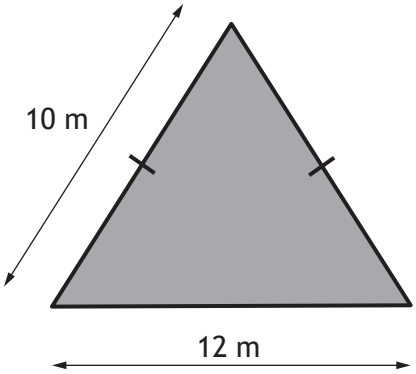
Tha leathad aig a nàbaidh Eilidh cuideachd.

Is e caisead an leathad aice 20%.

Tha Eilidh den bheachd gu bheil an leathad aice nas cas na leathad Iain.

(b) Dearbhaich ma tha i ceart. **2**

7. Thèid faiche a chruthachadh ann an cumadh triantan isosceles le tomhasan mar a chithear gu h-ìosal.



Obraich a-mach farsaingeachd an fhaiche. **3**

[Tionndaidh an duilleag

8. Tha Jack a' dol gu fèis ann am Poblachd nan Seiceach bhon dachaigh aige ann an Glaschu.

Bidh a mhàthair ag òrdachadh na tiogaidean a chosgas 1500 koruna Seiceach.

Tha a mhàthair a' fuireach anns a' Phòlainn agus mar sin feumaidh e a pàigheadh air ais ann an zloty Pòlach.

Co-luachan an airgid	
Punnd Sasannach (£)	**Airgeadrathan eile**
1	30.00 koruna Seiceach
1	4.96 zloty Pòlach

Obraich a-mach cia mheud zloty Pòladh a dh'fheumas e toirt don a mhàthair. **2**

9. Mar is trice, bidh Pòl ag obair 30 uairean a thìde gach seachdain.

Tha e a' faighinn pàigheadh ùine gu leth airson uairean a **bharrachd** sam bith a bhios e ag obair.

Is e an ìre pàighidh bunaiteach aige £12.50.

An t-seachdain sa chaidh, bha e ag obair 37 uairean gu h-iomlan.

(a) Obraich a-mach a thuarastal iomlan airson na seachdain sa chaidh. **3**

[Tionndaidh an duilleag

9. (a' leantainn)

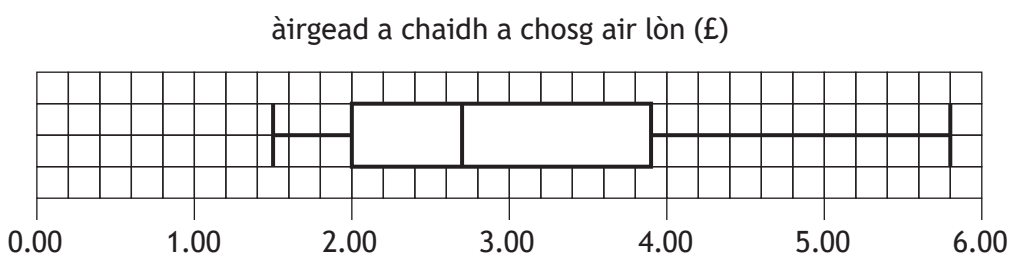
Tha Pol a' ceannach Tbh ùr.
Tha e air a shanasachadh aig prìs £825.
Rinn e co-dhùnadh plana pàighidh a chleachdadh gus an Tbh a cheannach.
Is e cosgais iomlan an Tbh le bhith a' cleachdadh a' phlana pàighidh £845.80.
Tha na pàighidhean air an obrachadh a-mach mar a leanas:

- tasgadh de $\frac{1}{5}$ de phrìs **sanasachd**
- 8 cuibhreannan mìosail co-ionann
- pàigheadh deireannach de £100.

(b) Obraich a-mach a' chuibhreann mìosail. **3**

10. Dh'fhaighnich Mgr Coinneach dhan chlas aige dè an t-airgead a bha iad air a chosg air an lòn.

Tha na toraidhean air an sealltainn anns a' bhocsa-phlota.



(a) Obraich a-mach an raon eadar-chairteal. **2**

Bha raon eadar-chairteal de £1.82 aig an airgead a chaidh a chosg air lòn le clas Mrs Caimbeul.

(b) Dèan aon bheachd dligheach a' dèanamh coimeas eadar an airgead a chaidh a chosg air lòn aig clas Mgr Coinneach agus clas Mrs Caimbeul. **1**

[Tionndaidh an duilleag

11. Bidh companaidh a' lìbhrigeadh pharsailean gu dachaighean dhaoine.

Is e an coltachd gun tig parsail air a mhilleadh 0.023.

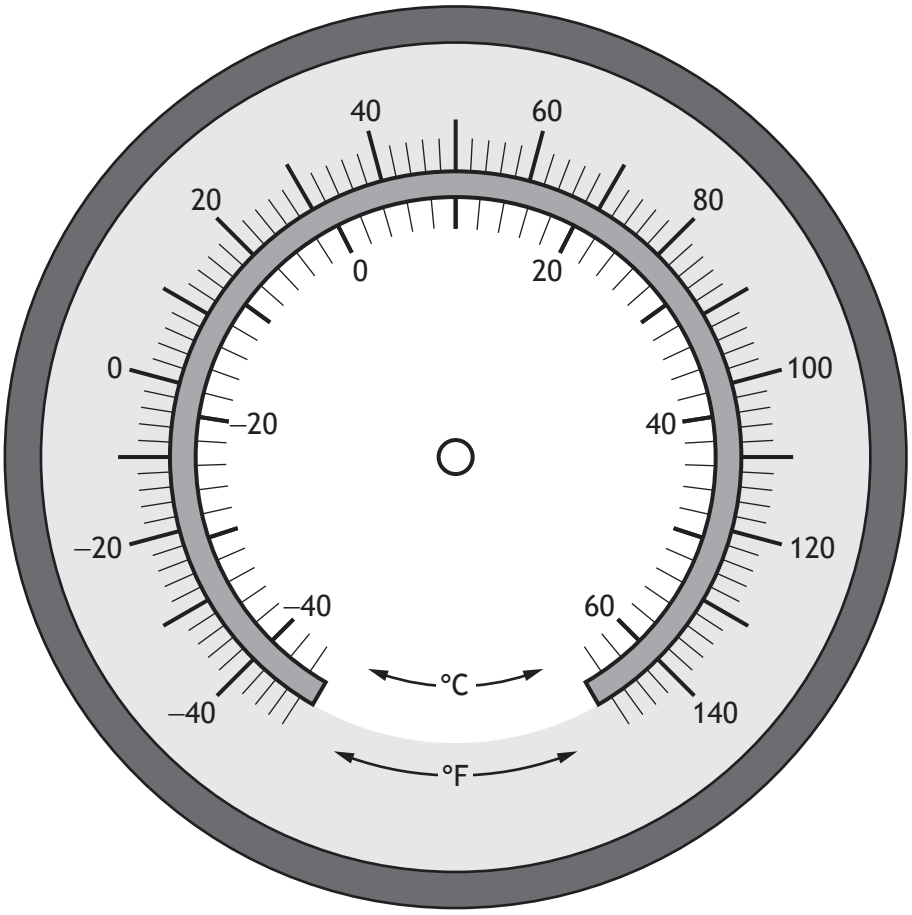
Ann an aon mhìos, lìbhrig a' chompanaidh 700 parsailean, agus chaidh 15 dhiubh sin a mhilleadh.

Faigh a-mach a bheil seo nas motha no nas lugha na bha dùil. **2**

[CRÌOCH A' PHÀIPEIR EISIMPLEIR]

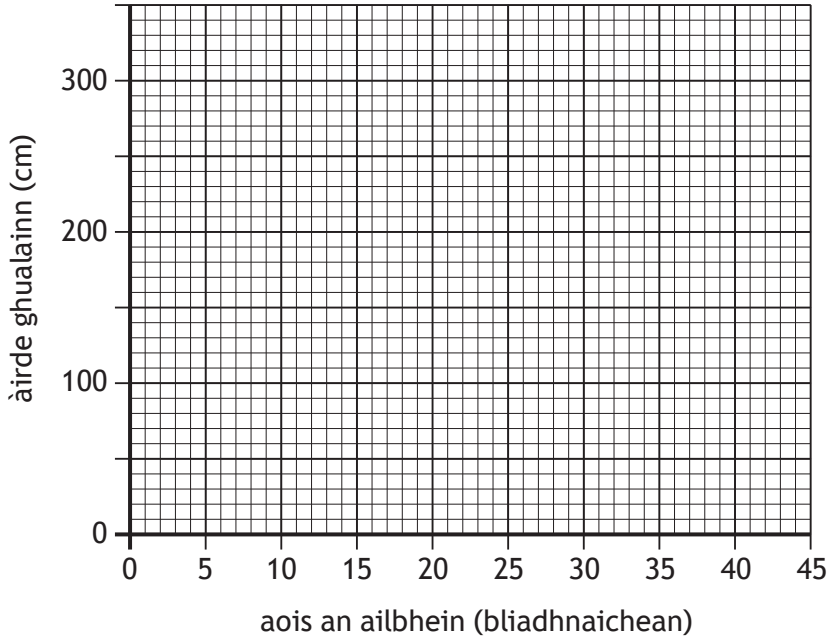
ÀITE A BHARRACHD AIRSON FHREAGAIRTEAN

Tomhaisear a bharrachd airson ceist 2



ÀITE A BHARRACHD AIRSON FHREAGAIRTEAN

Cliath a bharrachd airson ceist 3 (a)



National
Qualifications
SPECIMEN ONLY

S844/75/01

Applications of Mathematics
Paper 1 (Non-calculator)

Marking Instructions

These marking instructions have been provided to show how SQA would mark this specimen question paper.

SQA
©

General marking principles for National 5 Applications of 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.

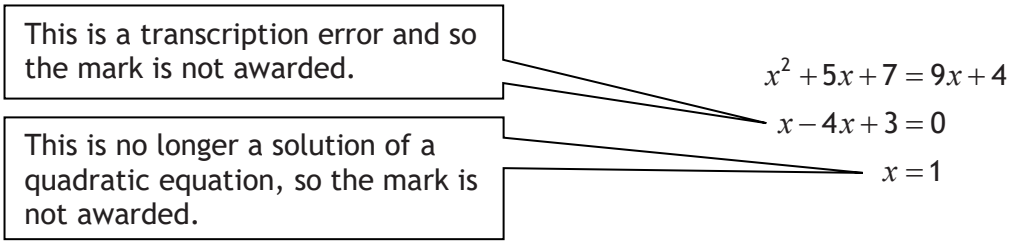
(d) If a candidate's response contains an error, all working subsequent to this error must still be marked. Only award marks if the level of difficulty in their working is similar to the level of difficulty in the illustrative scheme.

(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.

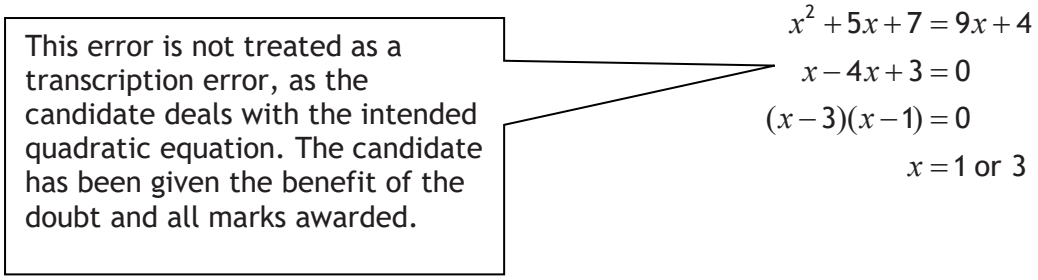
(f) Candidates may use any mathematically correct method to answer questions, except in cases where a particular method is specified or excluded.

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

$\frac{15}{0.3}$ 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) 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

(l) 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.

(m) 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.

(n) 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.

(o) 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] Process: calculate limits •[2] Process: identify rejected candles (or accepted candles) •[3] Process/communication: calculate percentage rejected	•[1] 22.3 and 22.7 •[2] 22.2, 22.9, 21.6, 22.8 (or 22.6, 22.5, 22.3, 22.6, 22.4, 22.7) •[3] 40%	**3**
2.			•[1] Process: calculate new temperature •[2] Communication: mark temperature on Celsius scale	•[1] -28 •[2] evidence	**2**
3.	(a)		•[1] Communication: 3 points correct •[2] Communication: all 5 points correct	•[1] evidence •[2] evidence	**2**
	(b)		•[3] Strategy: consistent line of best fit	•[3] evidence	**1**
	(c)		•[4] Communication: answer consistent with line of best fit	•[4] evidence	**1**
4.			•[1] Strategy: evidence of common denominator •[2] Process: add fractions •[3] Process: calculate the fraction that Jessica ate.	•[1] evidence of 21 or equivalent •[2] $\frac{29}{21}$ •[3] $\left(\frac{42}{21}-\frac{29}{21}=\right)\frac{13}{21}$	**3**
5.			•[1] Strategy/process: know how to deal with flight time •[2] Strategy: know how to deal with time difference •[3] Process: calculate stop time	•[1] 11:10pm or equivalent •[2] eg $11:10 + 8 = 7:10\text{am}$ or $8:50 - 8 = 00:50\text{am}$ or equivalent •[3] 1 hour 40 minutes	**3**

Question			Generic scheme	Illustrative scheme	Max mark
6.	(a)		•[1] Strategy: know how to find the gradient •[2] Process: calculate gradient of ramp in simplest form	•[1] $(8\times22.5)\div960$ •[2] $\frac{3}{16}$	**2**
	(b)		•[3] Strategy/Process: know how to compare gradients •[4] Strategy/communication: consider both gradients and consistent conclusion	•[3] $\frac{3}{16}$ and $\frac{3}{15}$ or equivalent •[4] $\frac{3}{16}<\frac{3}{15}$ she is correct	**2**
7.			•[1] Strategy: substitute correctly into Pythagoras' Theorem •[2] Process: calculate height •[3] Process: calculate area	•[1] $h^2=10^2-6^2$ •[2] 8 •[3] $8\times12\div2=48$	**3**
8.			•[1] Strategy: know to divide by 30 then multiply by 4.96 •[2] Process: all calculations correct	•[1] Evidence •[2] $1500\div30=50$ $50\times4.96=248$	**2**
9.	(a)		•[1] Process: calculate basic pay •[2] Strategy: know how to calculate overtime pay •[3] Process: calculate total gross pay	•[1] 30 × 12.50 = 375 •[2] 1.5 × 12.50 × 7 •[3] 375 + 131.25 = 506.25	**3**
	(b)		•[4] Process: calculate the deposit •[5] Process: calculate amount still payable •[6] Process: calculate how much each monthly payment is	•[4] $\frac{1}{5}\times825=165$ •[5] $845.80-(165+100)=580.80$ •[6] $580.80\div8=72.60$	**3**

Question			Generic scheme	Illustrative scheme	Max mark
10.	(a)		•[1] Communication: values of Q_1 and Q_3 identified •[2] Process: calculate the inter-quartile range	•[1] 2 and 3.9 •[2] 1.90	**2**
	(b)		•[3] Communication: comment regarding inter-quartile range	•[3] eg Mr Kenneth's class lunch expenditure is more varied	**1**
11.			•[1] Process: calculate expected frequency •[2] Communication: conclusion consistent with working	•[1] $(700 \times 0.023 =) 16.1$ •[2] less	**2**
			Alternative Strategy •[1] Process: calculate probability •[2] Communication: conclusion consistent with working	•[1] $(15 \div 700 =)\ 0.021(4285714\ldots)$ •[2] less	

[END OF SPECIMEN MARKING INSTRUCTIONS]