2013 Mathematics

Standard Grade – Credit

Finalised Marking Instructions

Part One: General Marking Principles for Mathematics Standard Grade – Credit

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 specific Marking Instructions for each question.

(a) Marks for each candidate response must always be assigned in line with these general marking principles and the specific Marking Instructions for the relevant question. 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. For technical assistance, e-mail or phone the e-marker helpline.

(b) Marking should always be positive ie, marks should be awarded for what is correct and not deducted for errors or omissions.

GENERAL MARKING ADVICE: Mathematics Standard Grade – Credit

The marking schemes are written to assist in determining the "minimal acceptable answer" rather than listing every possible correct and incorrect answer. The following notes are offered to support Markers in making judgements on candidates' evidence.

Special Instructions

1 The main principle in marking scripts is to give credit for the skills which have been demonstrated. Failure to have the correct method may not preclude a pupil gaining credit for the calculations involved or for the communication of the answer.

2 The answer to one part, correct **or incorrect** must be accepted as a basis for subsequent dependent parts of a question. Full marks in the dependent part are possible if it is of equivalent difficulty.

3 Do not penalise insignificant errors. An insignificant error is one which is significantly below the level of attainment being assessed.

eg An error in the calculation of 16 + 15 would not be penalised at Credit Level.

4 Working after a correct answer should **only** be taken into account if it provides **firm** evidence that the requirements of the question have not been met.

5 In certain cases an error will ease subsequent working. **Full** credit cannot be given for this subsequent work but **partial** credit may be given.

6 Accept answers arrived at by inspection or mentally, where it is possible for the answer to have been so obtained.

7 Do not penalise omission or misuse of units unless marks have been specifically allocated to units.

8 A wrong answer without working receives no credit unless specifically mentioned in the marking scheme.

The rubric on the outside of the Papers emphasises that working must be shown. In general markers will only be able to give credit to partial answers if working is shown. However there may be a few questions where partially correct answers unsupported by working can still be given some credit. **Any such instances will be stated in the marking scheme.**

9 Acceptable alternative methods of solution can only be given the marks specified, ie a more sophisticated method cannot be given more marks.

Note that for some questions a method will be specified.

10 In general do not penalise the same error twice in the one question.

11 Accept legitimate variations in numerical/algebraic questions.

12 Do not penalise bad form eg $\sin x^\circ = 0{\cdot}5 = 30^\circ$.

13 A transcription error, where a number has been erroneously transcribed from the examination question, is not normally penalised except where the question has been simplified as a result.

14 When multiple solutions are presented by the candidate and it is not clear which is intended to be the final one, mark all attempts and award the lowest mark.

15 If a response has been scored out and not replaced, the response should be marked as normal.

16 If multiple responses have been scored out and not replaced, Note 14 applies.

Part Two: Mathematics Standard Grade – Credit

Paper 1

Award marks in whole numbers only

Question	Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
1	Evaluate $86{\cdot}5 - 3{\cdot}651 \times 20$ **Ans: 13·48** •[1] knowing correct order of operations •[2] carrying out both calculations	**2** **(KU)**	•[1] must involve a multiplication followed by a subtraction •[2] 13·48

Notes:

(i) for 13·48 with/without working — award 2/2

(ii) for 1656·98 with/without working — award 1/2

(iii) for 73·02 with no further calculation — award 0/2

Question	Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
2	Evaluate $\frac{1}{2} \div 2\frac{2}{3}$ **Ans:** $\frac{\mathbf{3}}{\mathbf{16}}$ $\bullet^1$ process $\bullet^2$ a correct calculation	**2** **(KU)**	$\bullet^1$ $\frac{1}{2} \times \frac{3}{8}$ $\bullet^2$ $\frac{3}{16}$

Notes:

(i) for $\frac{3}{16}$ with/without working — award 2/2

(ii) for $\frac{8}{6}$ *or* $1\frac{2}{6}$ with/without working — award 1/2

(iii) $\frac{3}{16}$ leading to $5\frac{1}{3}$ cannot be awarded the second mark

Question	Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
3	A group of people attended a course to help them stop smoking. The following table shows the statistics before and after the course. |	***Mean number of cigarettes smoked per person per day*** | ***Standard deviation*** | | Before | 20·8 | 8·5 | | After | 9·6 | 12·0 | Make **two** valid comments about these results. **Ans: see below** •[1] comment about mean •[2] comment about standard deviation	**2** **(RE)**	•[1] on average fewer cigarettes were smoked per person after the course •[2] the number of cigarettes smoked per person was more varied after the course

Notes:

(i) do not accept 'the average number of cigarettes smoked per person was less'

(ii) do not accept 'the standard deviation after the course was greater'

Question	Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
4	Change the subject of the formula to *r*. $A = 4\pi r^2$ **Ans:** $\boldsymbol{r = \sqrt{\frac{A}{4\pi}}}$ •[1] starting process •[2] finding the square root	**2** **(KU)**	•[1] $r^2 = \frac{A}{4\pi}$ •[2] $r = \sqrt{\frac{A}{4\pi}}$

Notes:

(i) $r = \frac{\sqrt{A}}{\sqrt{4\pi}}$ award 2/2

(ii) for $r = \frac{\sqrt{A}}{4\pi}$ *or* $\sqrt{\frac{A \div 4}{\pi}}$ *or* $\sqrt{A \div 4 \div \pi}$ award 1/2

(iii) the final mark is for taking the square root of the given r^2

<table>
<tr><th colspan="3">Question</th><th>Marking Scheme
Give 1 mark for each •</th><th>Max Mark</th><th>Illustrations of evidence for awarding a mark at each •</th></tr>
<tr><td>5</td><td></td><td></td><td>150 patients have been given a flu vaccine.

The data is shown in the table below.

<table><tr><td rowspan="2">AGE</td><td colspan="2">GENDER</td></tr><tr><td>male</td><td>female</td></tr><tr><td>5 or under</td><td>4</td><td>3</td></tr><tr><td>6 – 15</td><td>7</td><td>8</td></tr><tr><td>16 – 59</td><td>37</td><td>47</td></tr><tr><td>60 or over</td><td>12</td><td>32</td></tr></table>
What is the probability that

a patient given the flu vaccine was male and aged 60 or over?

Ans: $\frac{\mathbf{12}}{\mathbf{150}}$ or equivalent

•[1] process</td><td>1

(KU)</td><td>•[1] $\frac{12}{150}$</td></tr>
<tr><td colspan="6">Notes:

(i) Do not accept answer in ratio form</td></tr>
<tr><td>5</td><td>b</td><td></td><td>a patient given the flu vaccine was aged 5 or under?

Ans: $\frac{\mathbf{7}}{\mathbf{150}}$

•[1] process</td><td>1

(KU)</td><td>•[1] $\frac{7}{150}$</td></tr>
<tr><td colspan="6">Notes:

(i) an answer in ratio form in part (b) may be awarded the mark as a follow through error from (a)</td></tr>
</table>

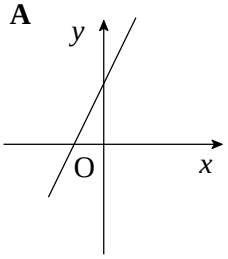
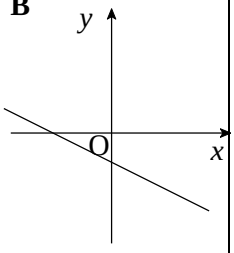
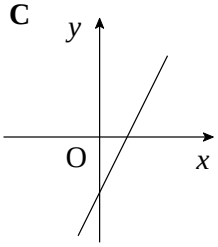
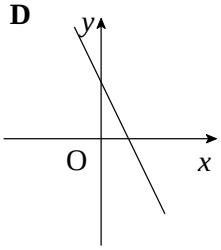
Question			Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
6	**a**		Joan buys gold and silver charms to make bracelets. 2 gold charms and 5 silver charms cost £125. Let g pounds be the cost of one gold charm and s pounds be the cost of one silver charm. Write down an equation in terms of g and s to illustrate the above information. **Ans: $2g + 5s = 125$** $\bullet^1$ process	**1** **(KU)**	$\bullet^1$ $2g + 5s = 125$
6	**b**		4 gold charms and 3 silver charms cost £145. Write down another equation in terms of g and s to illustrate this information. **Ans: $4g + 3s = 145$** $\bullet^1$ process	**1** **(KU)**	$\bullet^1$ $4g + 3s = 145$
6	**c**		Hence calculate the cost of each type of charm. **Ans: $g = 25$; $s = 15$** $\bullet^1$ starting process $\bullet^2$ value of one variable $\bullet^3$ value of a second variable	**3** **(RE)**	$\bullet^1$ evidence of scaling $\bullet^2$ $g = 25$ $\bullet^3$ $s = 15$

Notes:

(i) for $g = 25$ and $s = 15$ without working **but** checked in **both** equations award 1/3

(ii) for $g = 25$ and $s = 15$ without working award 0/3

Question			Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
7	**a**		Expand and simplify $(2x - 5)(x^2 + 3x - 7)$ **Ans: $2x^3 + x^2 - 29x + 35$** •[1] starting to expand •[2] continuing to process •[3] collecting like terms	**3** **(KU)**	•[1] any 3 correct terms •[2] a further 3 correct terms •[3] $2x^3 + x^2 - 29x + 35$
7	**b**		Solve the inequality $4x - 5 \leq 7x - 20$ **Ans: $x \geq 5$ or $5 \leq x$** •[1] dealing with variable •[2] dealing with constant •[3] solution	**3** **(KU)**	•[1] $-3x$ or $3x$ •[2] -15 or 15 •[3] $x \geq 5$ or $5 \leq x$

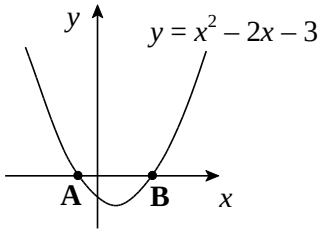
Question	Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
8	Four straight line graphs are shown below. **A**  **B**  **C**  **D**  Which one of these above could represent the line with equation $2x + y = 3$? **Give two reasons to justify your answer.** **Ans: graph D**	**3**	
	•[1] re-arranging		•[1] $y = -2x + 3$
	•[2] understanding		•[2] m – negative c – positive
	•[3] conclusion	**(RE)**	•[3] *D*

Notes:

(i) for an answer with no working award 0/3

(ii) for candidates who do not re-arrange, the 1st mark can be awarded only if the correct gradient and intercept are stated

Question			Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
9			Quick-Smile photographers charge the following rates: • 50p per photograph for the first 12 photographs printed • 35p per photograph for any further photographs printed • £4·25 for a CD of the photographs.		
	a		How much will it cost to have 16 photographs printed plus a CD? **Ans: £11·65**	**2**	
			•[1] starting the process		•[1] either (12 × 0·5)….. + 4·25 or (16 – 12) × 0·35
			•[2] calculation	**(KU)**	•[2] £11·65
Notes: (i) for £11·65 with/without working award 2/2 (ii) the 2nd mark may be awarded **only** for a correct calculation involving all 3 rates.					
9	**b**		Find a formula for C, the cost in pounds, of having *x* photographs printed (where *x* is greater than 12) plus a CD. **Ans: (c =) 6 + (*x*-12) 0·35 + 4·25**	**3**	
			•[1] starting strategy		•[1] 12 × 0·5
			•[2] continuing strategy		•[2] (*x* – 12) × 0·35
			•[3] formula	**(RE)**	•[3] 6 + (*x* – 12) 0·35 + 4·25
Notes: (i) ignore subsequent simplification (ii) candidates may work in pence, but final answer must be in pounds					

Question			Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
10			The parabola with equation $y = x^2 - 2x - 3$ cuts the x-axis at the points A and B as shown in the diagram.  		
	a		Find the coordinates of A and B. **Ans: A(−1,0), B(3,0)**	**4**	
			•¹ equating to zero		•¹ $x^2 - 2x - 3 = 0$
			•² factorising		•² $(x - 3)(x + 1) = 0$
			•³ solving for x		•³ $x = -1$ or 3
			•⁴ co-ordinates	**(RE)**	•⁴ A(−1,0), B(3,0)
Notes: (i) equating to zero must appear prior to solving for x (ii) for correct coordinates with no working award 0/4 (iii) candidates may draw graph – check page 15 on answer booklet					
10	**b**		Write down the equation of the axis of symmetry of $y = x^2 - 2x - 3$. **Ans: $x = 1$**	**1**	
			•¹ calculation	**(KU)**	•¹ $x = 1$
Notes: (i) an answer of 1 is not sufficient to gain the mark					

Question			Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
11			Jenny is doing calculations using consecutive numbers. She notices a pattern which always gives an answer of 1. Using 2, 3, 4 gives $3^2 - 2 \times 4 = 1$. 3, 4, 5 gives $4^2 - 3 \times 5 = 1$. 4, 5, 6 gives $5^2 - 4 \times 6 = 1$.		
	a		Using 8, 9, 10, write down a similar pattern. **Ans: $9^2 - 8 \times 10 = 1$**	**1**	
			$\bullet^1$ statement	**(KU)**	$\bullet^1$ $9^2 - 8 \times 10 = 1$
Notes: (i) do not accept $9^2 - 8 \times 10$					
11	**b**		Using n, (n + 1), (n + 2), show that the answer is 1 for any three consecutive numbers. **Ans: proof**	**3**	
			$\bullet^1$ beginning proof		$\bullet^1$ $(n + 1)^2 - n(n + 2)$
			$\bullet^2$ simplification		$\bullet^2$ $n^2 + 2n + 1 - n^2 - 2n$
			$\bullet^3$ proof	**(RE)**	$\bullet^3$ 1
Notes: (i) for the 2nd mark, brackets must be explicitly expanded (ii) the 3rd mark can be awarded only if the 2nd mark has been awarded					

KU 20
RE 18

[END OF PAPER 1 MARKING INSTRUCTIONS]

Paper 2

Award marks in whole numbers only

Question	Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
1	A snail crawls 3 kilometres in 16 days. What is the average speed of the snail in metres per second? Give your answer **in scientific notation correct to 2 significant figures**. **Ans: $2{\cdot}2 \times 10^{-3}$**	**4**	
	•[1] evidence of correct formula with units		•[1] $\frac{3km}{16\,\text{days}}$
	•[2] correct conversion of units		•[2] $\frac{3000}{16\times 24\times 60\times 60}$
	•[3] unrounded solution		•[3] $0{\cdot}00217$
	•[4] correct rounding and scientific notation		•[4] $2{\cdot}2 \times 10^{-3}$
		(KU)	

Notes:

(i) for $2{\cdot}2 \times 10^{-3}$ with/without working — award 4/4

(ii) for $2{\cdot}17 \ldots \times 10^{-3}$, with or without working — award 3/4

(iii) for $\frac{3}{16}$, leading to $1{\cdot}9 \times 10^{-1}$ — award 1/4

(iv) for $\frac{3}{16}$, followed by $\frac{3000}{16\times 24\times 60\times 60}$ — award the first two marks

(v) for $\frac{3}{16}$, followed by a correct partial conversion — award the first mark

Question	Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
2	Solve the equation $2x^2 + 7x - 3 = 0$ Give your answers **correct to 1 decimal place**. **Ans: 0·4 or −3·9**	**4**	
	•[1] correct substitution into quadratic formula		•[1] $\frac{-7 \pm \sqrt{7^2 - 4 \times 2 \times -3}}{4}$
	•[2] correct discriminant		•[2] 73
	•[3] unrounded solution		•[3] 0·385, −3·885
	•[4] rounded solution	**(KU)**	•[4] 0·4, −3·9

Notes:

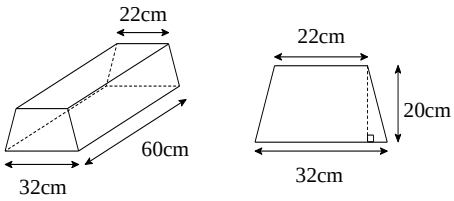
alternative evidence for 3rd and 4th marks

3rd mark (one solution and rounded) 0·385 → 0·4

4th mark (another solution and rounded) – 3·885 → 3·9

(i) only the first mark is available for candidates who process to a negative discriminant

(ii) candidates who do not give an unrounded number cannot be awarded the last 2 marks, **unless**
the final answer is 0·4, −3·9 where 3/4 may be awarded

Question			Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
3			A concrete block is in the shape of a prism.  The cross section of the prism is a trapezium with dimensions as shown.		
	a		Calculate the area of the cross section. **Ans: 540 cm^2**	**3**	
			•^{1} beginning process		•^{1} $2\times\frac{1}{2}\times5\times20+(22\times20)$ or $\frac{1}{2}\times20\times(22+32)$
			•^{2} processing		•^{2} 100 + 440 or 10 × 54
			•^{3} calculation	**(KU)**	•^{3} 540
3	**b**		Calculate the volume of the concrete block. **Ans: 32 400 cm^3**	**1**	
			•^{1} calculation	**(KU)**	•^{1} 32 400

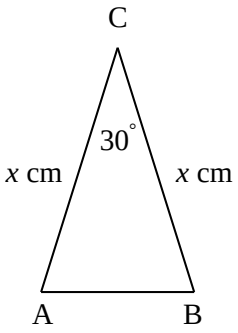
Question	Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
4	Last year, 1296 learner drivers from "Topflight" school of motoring passed their driving test. This was 72% of those who sat their driving test from Topflight. How many **failed** their driving test? **Ans: 504**	**3**	
	•[1] valid strategy		•[1] 72% = 1296
	•[2] processing		•[2] $1\% = \frac{1296}{72} = 18$
	•[3] solution	**(RE)**	•[3] $18 \times 28 = 504$

Notes:

(i) for 504, with/without working — award 3/3

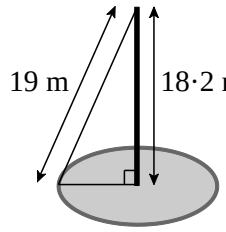
(ii) for candidates who calculate either 28% or 72% of 1296 — award 0/3

(iii) the final mark is for multiplying 1% by 28

Question	Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
5	ABC is an isosceles triangle with angle ACB = 30°. AC = BC = x centimetres.  The area of triangle ABC is 9 square centimetres. Calculate the value of x. **Ans: $x = 6$**	**3**	
	•[1] correct substitution into area formula		•[1] $9 = \frac{1}{2} \times x^2 \times \sin 30^\circ$
	•[2] processing		•[2] 36
	•[3] solution	**(RE)**	•[3] $x = 6$

Notes:

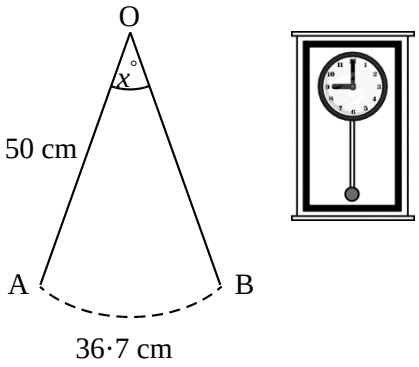
(i) accept $9 = \frac{1}{2} ab \sin 30^\circ$ for first mark

Question	Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
6	A mobile phone mast, 18·2 metres high, stands vertically in the centre of a circle. It is supported by a wire rope, 19 metres long, attached to the ground at a point on the circumference of the circle, as shown.  Calculate the circumference of the circle.		
	Ans: 34·3 m	**3**	
	•[1] correct use of Pythagoras		•[1] $r^2 = 19^2 - 18{\cdot}2^2$
	•[2] calculating radius		•[2] 5·455
	•[3] calculating circumference	**(KU)**	•[3] 34·3

Question	Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
7	Jack weighs 94 kilograms. On the 1st of January, he starts a diet which is designed to reduce his weight by 7% per month. During which month should he achieve his target weight of 73 kilograms? **Show all your working.**		
	Ans: during April	**4**	
	•[1] reduction factor		•[1] 0·93
	•[2] processing		•[2] 0·93 × 94 = 87·42
	•[3] continuation		•[3] … 75·6
	•[4] communication	**(RE)**	•[4] During April or 4th month

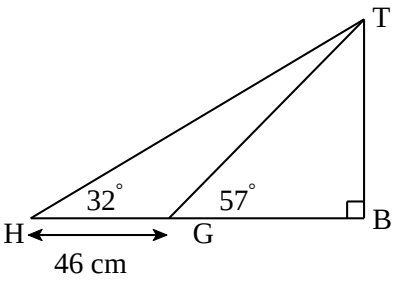
Notes:

(i) for use of a "simple interest" method only the first two marks are available

Question	Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
8	As the pendulum of a clock swings, its tip moves through an arc of a circle.  The length of the pendulum is 50 centimetres. The length of the arc is 36·7 centimetres. Calculate $x°$, the angle through which the pendulum swings. **Ans: 42°**	**3**	
	•[1] strategy		•[1] $\frac{x}{360}$
	•[2] strategy		•[2] $\frac{36\cdot7}{100\pi}$
	•[3] solution	**(RE)**	•[3] 42°

Notes:

(i) for use of $C = \pi r^2$, the 1st and 3rd marks are still available

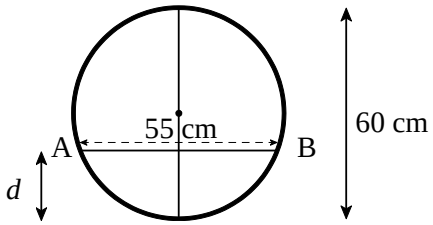
Question	Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
9	In triangle THB: • angle TBH = 90° • angle THB = 32° G is a point on HB. • angle TGB = 57° • GH = 46 metres.  Calculate the length of TB. **Ans: 48·4 m**	**4**	
	•[1] correct use of sine rule in triangle THG		•[1] $\frac{TG}{\sin 32^\circ} = \frac{46}{\sin 25^\circ}$
	•[2] calculation		•[2] TG = 57·679…
	•[3] appropriate trig ratio		•[3] $\sin 57^\circ = \frac{TB}{57\cdot679...}$
	•[4] solution	**(KU)**	•[4] TB = 48·37…

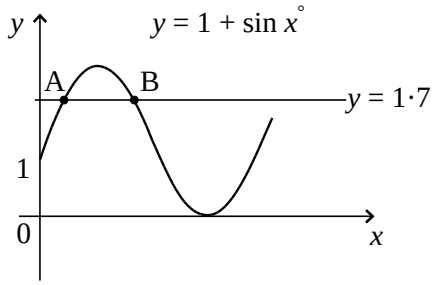
Notes:

(i) do not penalise early rounding

(ii) the 2nd and 4th marks are available only within a valid strategy

Question			Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
10	**a**		A function is given by the formula, $f(x) = 4 \times 2^x$. Evaluate $f(3)$. **Ans: 32** •[1] substitution •[2] calculation	**2** **(KU)**	•[1] 4×2^3 •[2] 32
10	**b**		Given that $f(m) = 4$, find the value of m. **Ans: $m = 0$** •[1] substitution •[2] solution	**2** **(RE)**	•[1] $4 = 4 \times 2^m$ •[2] $m = 0$

Question			Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
11			Water flows through a horizontal pipe of diameter 60 centimetres. The surface width, AB, of the water is 55 centimetres.  		
	a		Calculate the depth, *d*, of the water in the pipe. **Ans: 18·01 cm**	**4**	
			•[1] recognition of right angle		•[1] use of Pythagoras
			•[2] processing		•[2] $30^2 - 27{\cdot}5^2$
			•[3] processing		•[3] 11·99
			•[4] solution	**(KU)**	•[4] 18·01
Notes: (i) for one mark, the right angle may be stated or indicated on a diagram					
11	**b**		What other depth of water would give the same surface width? **Ans: 41·99 cm**	**1**	
			•[1] communication	**(RE)**	•[1] 41·99

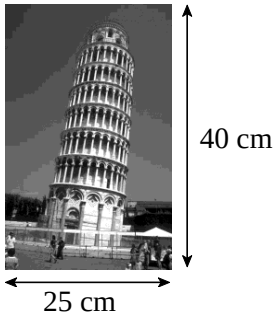
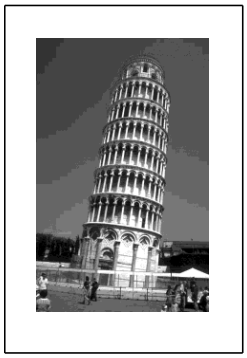
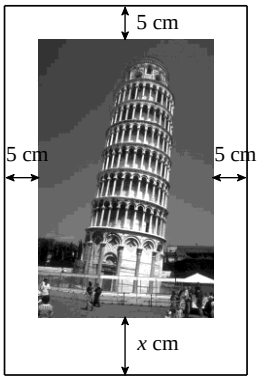
Question	Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
12	Part of the graph of $y = 1 + \sin x^\circ$ is shown in the diagram below.  The line $y = 1{\cdot}7$ is drawn. It cuts the graph of $y = 1 + \sin x^\circ$ at A and B as shown. Calculate the x-coordinates of A and B.		
	Ans: 44·4°, 135·6°	**4**	
	•[1] equating functions		•[1] $1 + \sin x^o = 1{\cdot}7$
	•[2] processing		•[2] $\sin x^o = 0{\cdot}7$
	•[3] first solution		•[3] $44{\cdot}4^\circ$
	•[4] second solution	**(RE)**	•[4] $135{\cdot}6^\circ$

Notes:

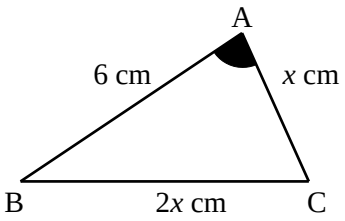
(i) candidates who obtain a negative value of sin x may still be awarded the last two marks for angles in the 3rd and 4th quadrants

(ii) candidates who give more than two answers **cannot** be awarded the last mark

(iii) **caution** $44{\cdot}4^\circ + 90^\circ = 134{\cdot}4^\circ$
this is close to the correct answer

Question	Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
13	Asim has a poster which is 25 centimetres wide and 40 centimetres high.  He decides to place it on a white card. The card and the poster are mathematically similar.  The border is 5 centimetres wide on three sides and x centimetres wide on the fourth side as shown.  Calculate the value of x.		

Question			Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
13			**Ans: $x = 11$** Method 1 •[1] strategy •[2] applying scale factor •[3] processing •[4] solution	**4**	 •[1] scale factor $= \frac{35}{25}$ •[2] $\left(\frac{7}{5}\right) \times 40$ •[3] 56 •[4] 11
			Ans: $x = 11$ Method 2 •[1] strategy •[2] equating ratios •[3] cross multiplication •[4] solution **(RE)**		 •[1] $\frac{25}{40}$ or $\frac{35}{45+x}$ •[2] $\frac{25}{40} = \frac{35}{45+x}$ •[3] $25(45 + x) = 35 \times 40$ •[4] 11

Question	Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
14	In triangle ABC: • cos A = 0·5 • AB = 6 centimetres • BC = 2x centimetres • AC = x centimetres  Show that $x^2 + 2x - 12 = 0$ **Ans: $x^2 + 2x - 12 = 0$**	**3**	
	•[1] substitution into cosine rule		•[1] $(2x)^2 = x^2 + 6^2 - 2 \times x \times 6 \times 0{\cdot}5$
	•[2] processing		•[2] $4x^2 = x^2 - 6x + 36$
	•[3] completion of proof	**(RE)**	•[3] $x^2 + 2x - 12 = 0$

Notes:

(i) $2x^2$ is to be treated as bad form for the 1st mark

(ii) the final mark is given only for an explicit statement

KU 25
RE 27

OVERALL TOTAL MARKS
45 KU 45 RE

[END OF PAPER 2 MARKING INSTRUCTIONS]