OCR
RECOGNISING ACHIEVEMENT

SPECIMEN

GENERAL CERTIFICATE OF SECONDARY EDUCATION

MATHEMATICS C
Higher Tier

TERMINAL PAPER – SECTION A

SPECIMEN

H **B282/A**

Candidates answer on the question paper.

Time: 1 hour

Additional Materials:
Geometrical instruments
Tracing paper (optional)

Candidate Name	

Centre Number						Candidate Number				

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above.
- Answer **all** the questions.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- In many questions marks will be given for a correct method even if the answer is incorrect.
- Do **not** write in the bar code.
- Do **not** write outside the box bordering each page.
- WRITE YOUR ANSWER TO EACH QUESTION IN THE SPACE PROVIDED. ANSWERS WRITTEN ELSEWHERE WILL NOT BE MARKED.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this section is 50.

WARNING You are not allowed to use a calculator in this paper.

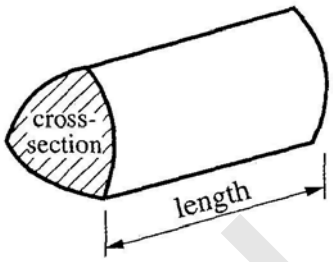
For Examiner's Use	
Section A	

This document consists of **12** printed pages.

  [Turn over

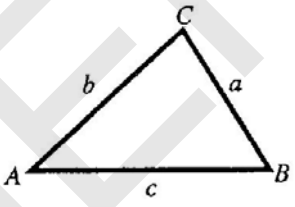
FORMULAE SHEET

Volume of prism = (area of cross-section) x length



In any triangle *ABC*

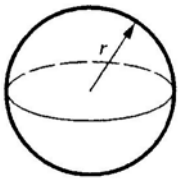
Sine rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$



Cosine rule $a^2 = b^2 + c^2 - 2bc\cos A$

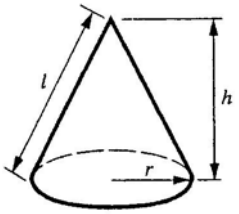
Area of triangle $= \frac{1}{2}ab\sin C$

Volume of sphere $\frac{4}{3}\pi r^3$



Surface area of sphere $= 4\pi r^2$

Volume of cone $= \frac{1}{3}\pi r^2 h$



Curved surface area of cone $= \pi rl$

The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$, where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$$

1 **(a)** Use the fact that **84 x 127 = 10668** to work out the following.

$10668 \div 840$

(a) _____ [1]

(b) Estimate $\frac{42 \times 302}{58}$.

Show how you obtained your answer.

(b) _____ [2]

(c) Write 70 out of 200 as a percentage.

(c) _____ % [2]

(d) Which of these fractions is closest to $\frac{1}{2}$?

$\frac{3}{5}$ $\frac{7}{10}$ $\frac{9}{20}$ $\frac{17}{40}$

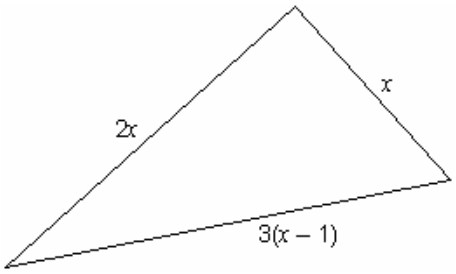
Show how you decide.

(d) _____ [2]

7

[Turn over

2 **(a)** Write down and simplify an expression for the perimeter of this triangle.



(a) _____ [2]

(b) Solve.

$6x + 4 = 2x + 7$

(b) _____ [3]

(c) The nth term of a sequence is $4n - 1$.

Find the first three terms of this sequence.

(c) ……..… ……. …….. [2]

7

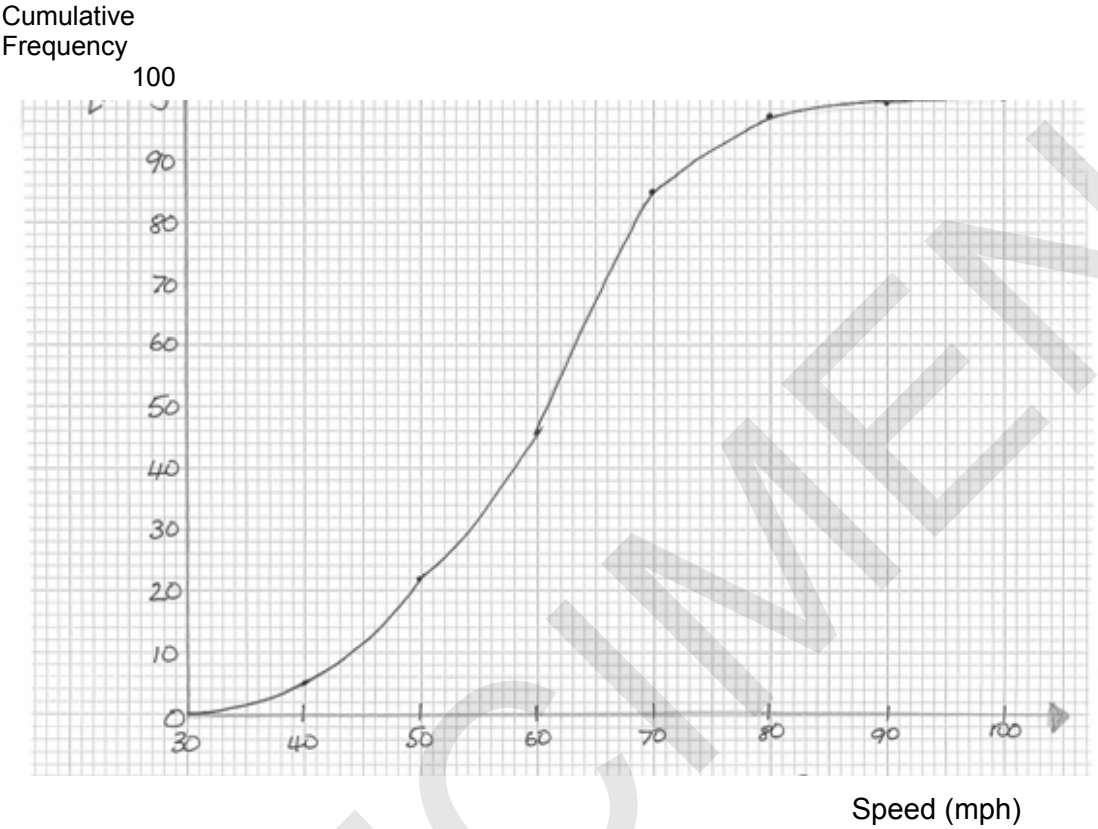
3 This table gives the probabilities of obtaining the different colours when a sweet is chosen at random.

Colour	Probability
Green	0·15
Red	0·3
Orange	0·35
Purple	

Complete the table. [2]

2

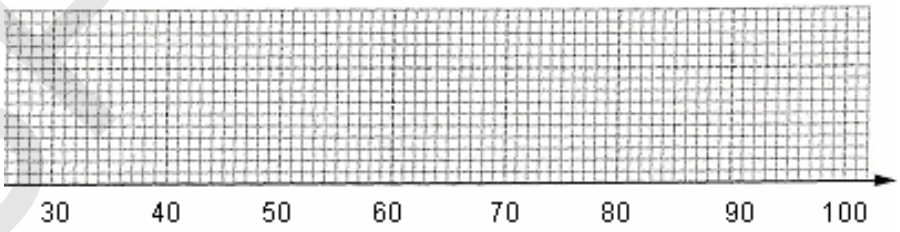
4 The cumulative frequency graph shows the results of a survey into the speed of cars on a motorway.



(a) The legal limit is 70 mph.
How many cars were travelling above the legal limit?

(a) _____ [2]

(b) On the scale below, draw a box plot for these results.

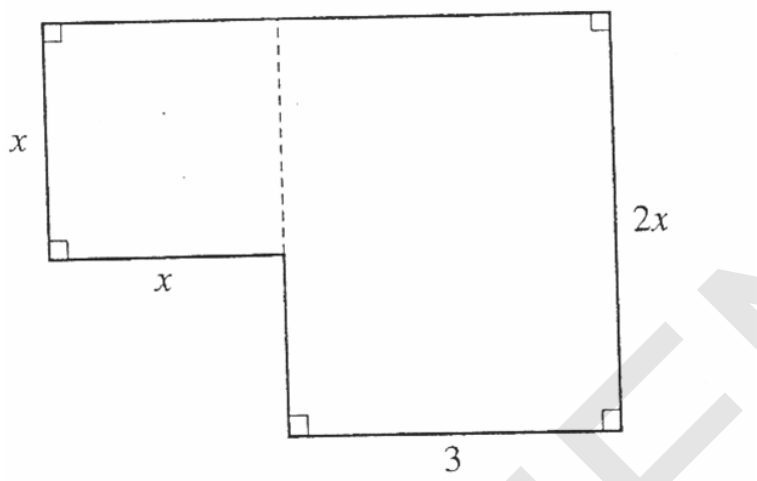


[3]

5

[Turn over

5 All the lengths in this question are in metres.



The diagram shows the plan of a room.

(a) Show that the area, A, of the room is given by $A = x^2 + 6x$.

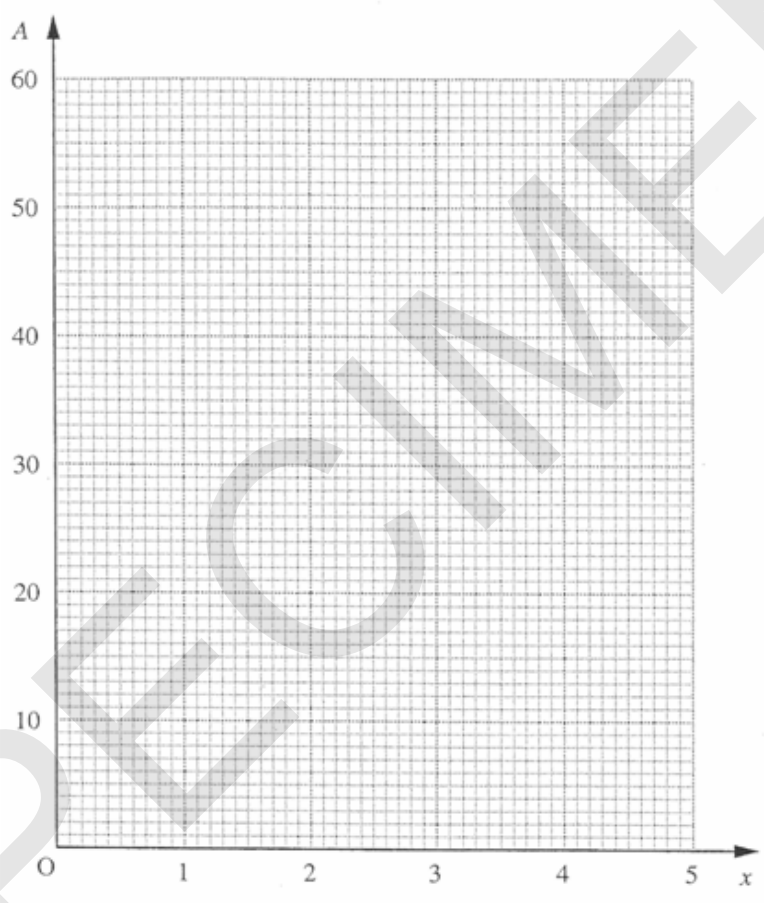
[2]

5 **(b)** Complete the table for $A = x^2 + 6x$.

x	0	1	2	3	4	5
A	0		16	27	40	

[2]

(c) Draw a graph of $A = x^2 + 6x$ on the grid below.



[2]

(d) The area of the room is 35 m^2.

Use your graph to find the length of the side x.

(d) _____ m [1]

7

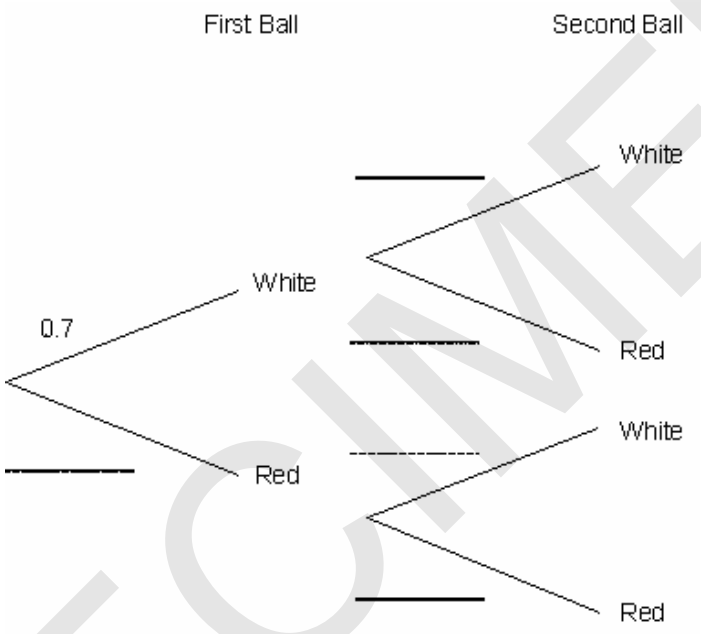
[Turn over

6 **(a)** A bag contains only white balls and red balls.

The probability of picking a white ball is 0·7.

Janet picks a ball from the bag without looking.
She notes its colour and replaces it.
She then picks another ball.

(i) Complete the tree diagram.



[2]

(ii) What is the probability that Janet picks one ball of each colour?

(a)(ii) _____ [3]

6 **(b)** Sarah has a different bag containing only blue balls and green balls.

Sarah picks a ball from the bag without looking.
She notes its colour and replaces it.
She then picks another ball.

The probability that Sarah picks a blue ball is p.

(i) Write down an expression, in terms of p, for the probability that Sarah picks two blue balls.

(b)(i) _____ [1]

(ii) The probability that Sarah picks two blue balls is 0·64. There are 50 balls altogether in the bag.

How many blue balls are in the bag?

(ii) _____ [2]

8

[Turn over

7 **(a)** Simplify.

$$\frac{4x^2y^5}{x^3y^3}$$

(a) _____ [2]

(b) **(i)** Factorise.

$$x^2 - 7x + 10$$

(b)(i) _____ [2]

(ii) Hence solve.

$$x^2 - 7x + 10 = 0$$

(ii) _____ [1]

5

8 **(a)** Write the recurring decimal $0 \cdot \dot{3}\dot{7}$ as a fraction.

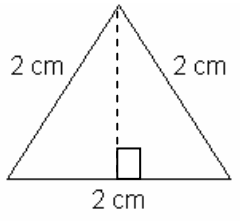
(a) _____ [2]

(b) Evaluate $\sqrt{3} \times \sqrt{27}$.

(b) _____ [2]

4

9 An equilateral triangle has side 2 cm.

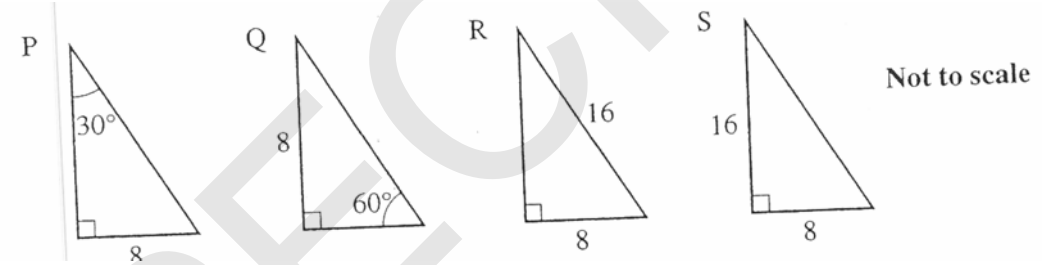


(a) Explain how this triangle may be used to show that

$\cos 60° = \frac{1}{2}$ and $\sin 60° = \frac{\sqrt{3}}{2}$.

[2]

(b) One of the triangles Q, R and S below is congruent to triangle P.



Identify this triangle and justify your answer.

_____ because _____

[3]

5

Section A Total [50]

OCR
RECOGNISING ACHIEVEMENT

OXFORD CAMBRIDGE AND RSA EXAMINATIONS

General Certificate of Secondary Education

MATHEMATICS C B282/A

TERMINAL PAPER – SECTION A (Higher Tier)

Specimen Mark Scheme

The maximum mark for this paper is 50.

1	**(a)**	12·7	**B1**			
	(b)	200	**B2**			
	(c)	35%	**M1A1**			M1 $\frac{35}{100}$ or 70÷200x100
	(d)	$\frac{9}{20}$	**M1A1**	**7**		M1 equivalent fractions denominator 40 or decimals 0.6, 0.7, 0.45, 0.425
2	**(a)**	$6x - 3$	**B2**			B1: $2x + x + 3x - 3$
	(b)	x = ¾ or 0·75	**B3**			M2: $4x = 3$ or M1 for one side correct
	(c)	3, 7, 11	**B2**	**7**		B1: 2 terms correct
3		0·2	**M1A1**	**2**		M1 1 – (0·15 + 0·3 + 0·35)
4	**(a)**	14-16	**B2**			M1 100 – their (15)
	(b)	correct plot box	**B3**			B1 LQ 52 B1 Median 61
				5		B1 UQ 67
5	**(a)**	$x \times x + 3 \times 2x$	**B2**			Convincing
	(b)	7, …, …, …, 55	**B1**			
	(c)	smooth curve through plotted points	**B1**			B1 1 error in plots
	(d)		**B2**			
		3.5 – 3.7 ft	**B1**ft	**7**		
6	**(a)(i)**	Correct tree diagram	**B2**			3 correct entries
	(ii)	0.42	**M2A1**			M1 (0.7 x 0.3) M1 2 x their (0.21)
	(b)(i)	p^2	**B1**			
	(ii)	40	**M1A1**	**8**		M1 p = 0.8 seen
7	**(a)**	$4y^2/x$	**B2**			
	(b)(i)	$(x - 5)(x - 2)$	**B2**			
	(ii)	$x = 5$ or 2	**B1**	**5**		
8	**(a)**	$100x = 37.37\ldots$	**M1**			
		$99x = 37$				
		$x = \frac{37}{99}$	**A1**			
	(b)	$\sqrt{81}$ or $3\sqrt{3}$	**M1**			
		9	**A1**	**4**		

9	**(a)**	showing right-angled triangle has sides 1 and 2 cm and using Pythagoras to obtain 3rd side as $\sqrt{3}$	**B1**			
		completion using cos = adj/hyp and sin = opp/hyp	**B1**			
	(b)	R	**B1**			
		angles 30 and 60,	**B1**			
		corresponding sides of 8	**B1**	**5**		

Section A Total 50

Assessment Objectives Grid

Question	AO2	AO3	AO4	Total
1	7			**7**
2	7			**7**
3			2	**2**
4			5	**5**
5	6	1		**7**
6			8	**8**
7	5			**5**
8	4			**4**
9		5		**5**
Totals	**29**	**6**	**15**	**50**