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.

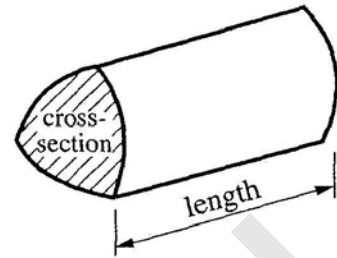**WARNING** You are not allowed to use a calculator in this paper.

For Examiner's Use

Section A

# FORMULAE SHEET

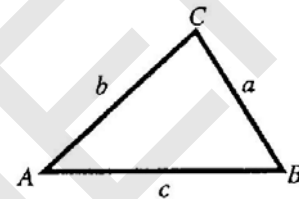**Volume of prism =** (area of cross-section) x length

**In any triangle *ABC***

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

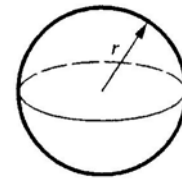**Cosine rule** $a^2 = b^2 + c^2 - 2bc \cos A$
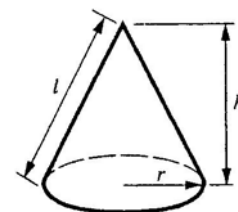
**Area of triangle** $= \dfrac{1}{2}ab \sin C$

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

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

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

**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 $\dfrac{42 \times 302}{58}$.

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 $\dfrac{1}{2}$?

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

Show how you decide.

**(d)** _____ [2]

7

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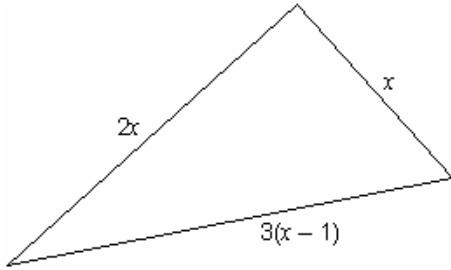


(a) _____ [2]

**(b)** Solve.

$$6x + 4 = 2x + 7$$

(b) _____ [3]

**(c)** The $n$th 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.



Cumulative Frequency

Speed (mph)
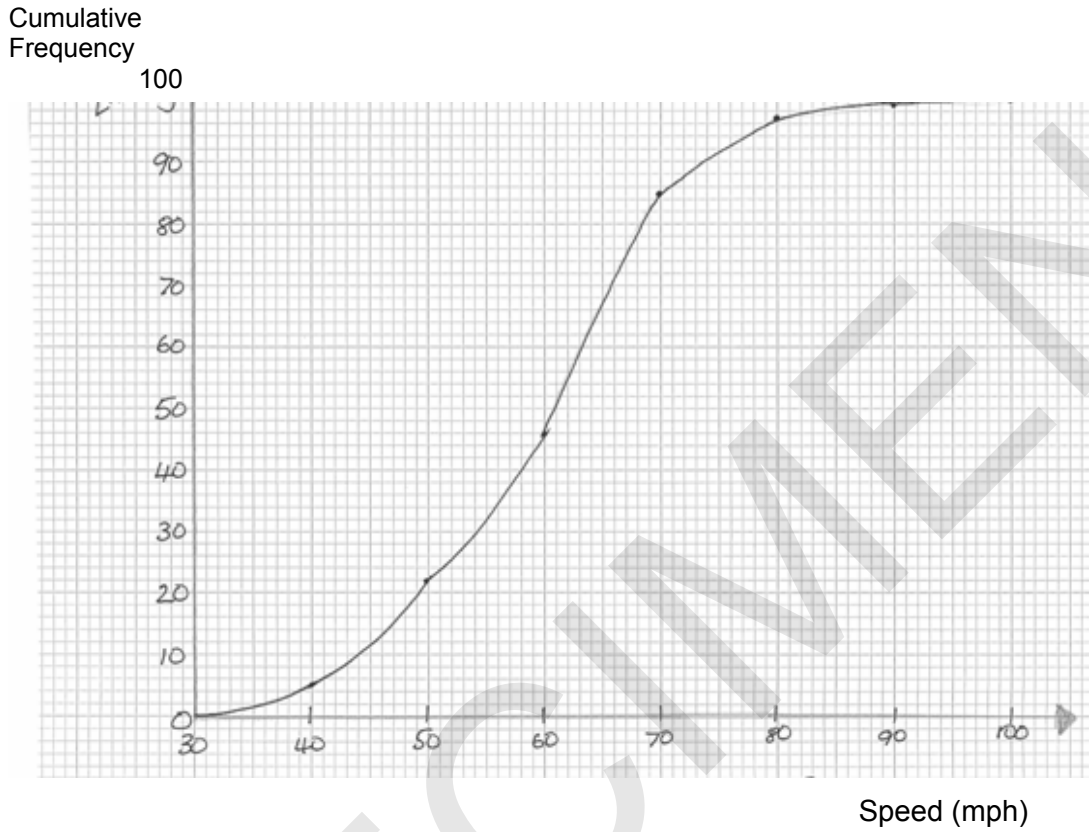
**(a)** The legal limit is 70 mph.

How many cars were travelling above the legal limit?

(a) _____ [2]

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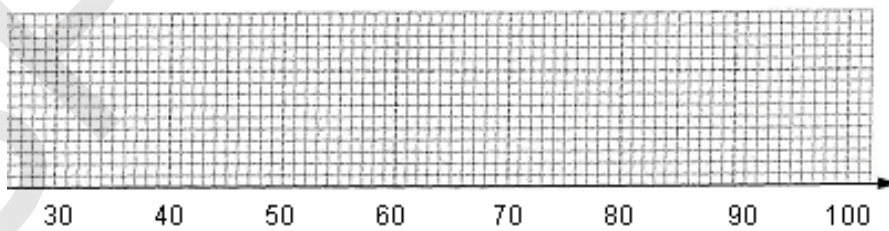


[3]

| 5 | |
|---|---|

**[Turn over**

**5** All the lengths in this question are in metres.
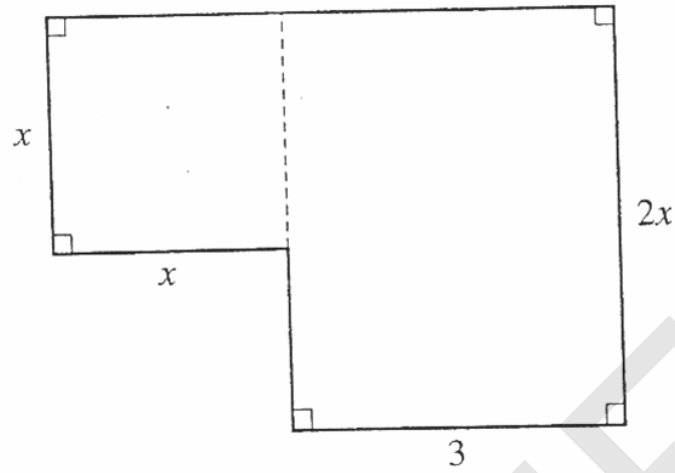


The diagram shows the plan of a room.

**(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.
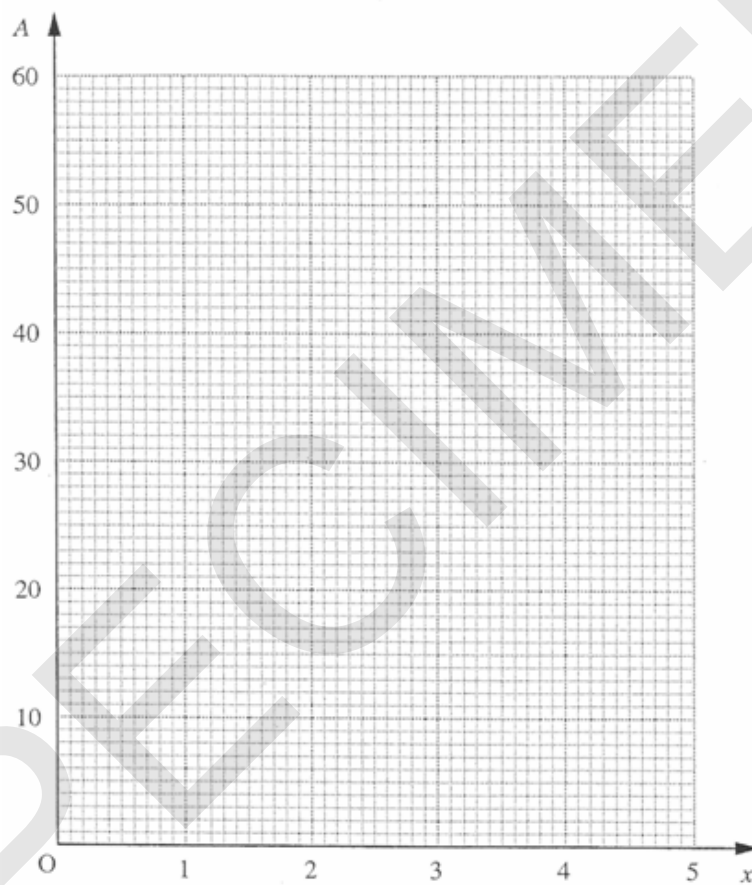


[2]

**(d)** The area of the room is 35 m².

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.

First Ball          Second Ball

                                    White

                    White

        0.7                         Red

                                    White

                    Red

                                    Red
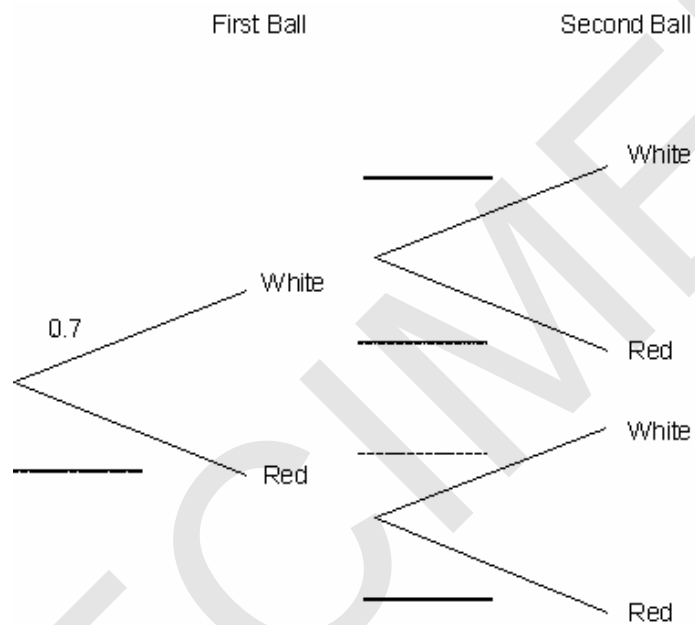
[2]

**(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.

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

**(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 | |
|---|---|

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**9** An equilateral triangle has side 2 cm.
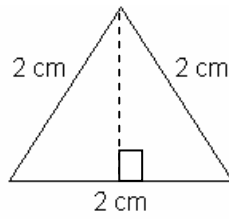


**(a)** Explain how this triangle may be used to show that

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

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[2]

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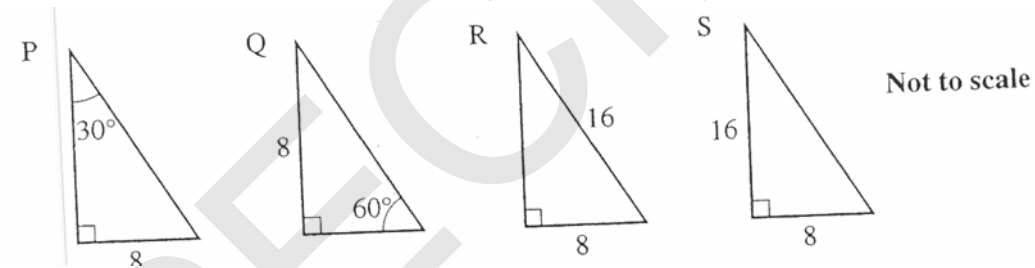


Identify this triangle and justify your answer.

------------- because ---------------------------------------------------------------------

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[3]

5

**Section A Total [50]**

**12**

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS**

**General Certificate of Secondary Education**

# MATHEMATICS C                                        B282/A

## TERMINAL PAPER – SECTION A

### 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** | 5 | | B1 LQ 52 <br> B1 Median 61 <br> 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) | 3.5 – 3.7 ft | **B2** <br> **B1**ft | 7 | | |
| 6 | (a)(i) | Correct tree diagram | **B2** | | | 3 correct entries |
| | (ii) | 0.42 | **M2A1** | | | M1 (0.7 x 0.3) <br> 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) | $100x = 37.37 …..$ <br> $99x = 37$ <br> $x = \frac{37}{99}$ | **M1** <br><br> **A1** | | | |
| | (b) | $\sqrt{81}$ or $3\sqrt{3}$ <br> 9 | **M1** <br> **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** |