

Candidate Forename		Candidate Surname	
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Centre Number						Candidate Number				
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**OXFORD CAMBRIDGE AND RSA EXAMINATIONS  
GENERAL CERTIFICATE OF SECONDARY EDUCATION**

**B279A**

**MATHEMATICS C  
(GRADUATED ASSESSMENT)**

**MODULE M9 – SECTION A**

**THURSDAY 21 JANUARY 2010: Afternoon**

**DURATION: 30 minutes**

**SUITABLE FOR VISUALLY IMPAIRED CANDIDATES**

**Candidates answer on the Question Paper**

**OCR SUPPLIED MATERIALS:**

**None**

**OTHER MATERIALS REQUIRED:**

**Geometrical instruments**

**Tracing paper (optional)**

**WARNING**

**No calculator can be used for  
Section A of this paper.**

**READ INSTRUCTIONS OVERLEAF**

## **INSTRUCTIONS TO CANDIDATES**

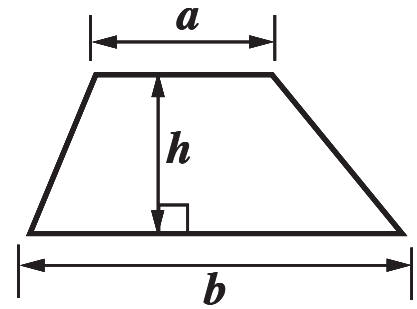
- **Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes on the first page.**
- **Use black ink. Pencil may be used for graphs and diagrams only.**
- **Read each question carefully and make sure that you know what you have to do before starting your answer.**
- **Show your working. Marks may be given for a correct method even if the answer is incorrect.**
- **Answer ALL the questions.**
- **Write your answer to each question in the space provided, however additional paper may be used if necessary.**

## **INFORMATION FOR CANDIDATES**

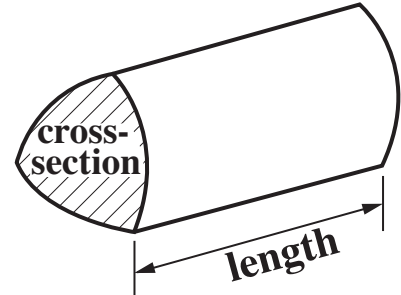
- **The number of marks is given in brackets [ ] at the end of each question or part question.**
- **The total number of marks for this Section is 25.**

# FORMULAE SHEET

**Area of trapezium** =  $\frac{1}{2} (a + b)h$



**Volume of prism** = (area of cross-section)  $\times$  length

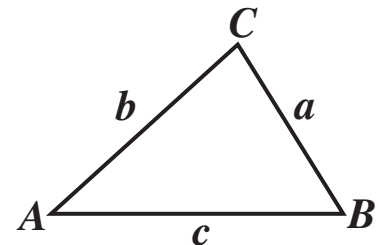


**In any triangle ABC**

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

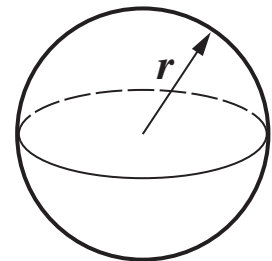
**Cosine rule**  $a^2 = b^2 + c^2 - 2bc \cos A$

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



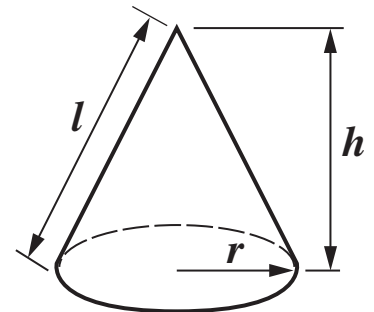
**Volume of sphere** =  $\frac{4}{3}\pi r^3$

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



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

**Curved surface area of cone** =  $\pi r l$



**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 Work out.**

**(a)  $8^0$**   
**[1 mark]**

**(a)** \_\_\_\_\_

**(b)  $3^{-2} \times 3^6$**   
**[2 marks]**

**(b)** \_\_\_\_\_

**(c)  $36^{\frac{1}{2}}$**   
**[1 mark]**

**(c)** \_\_\_\_\_

(d)  $(6 \times 10^{11}) \times (5 \times 10^{-3})$

**Give your answer in standard form.  
[2 marks]**

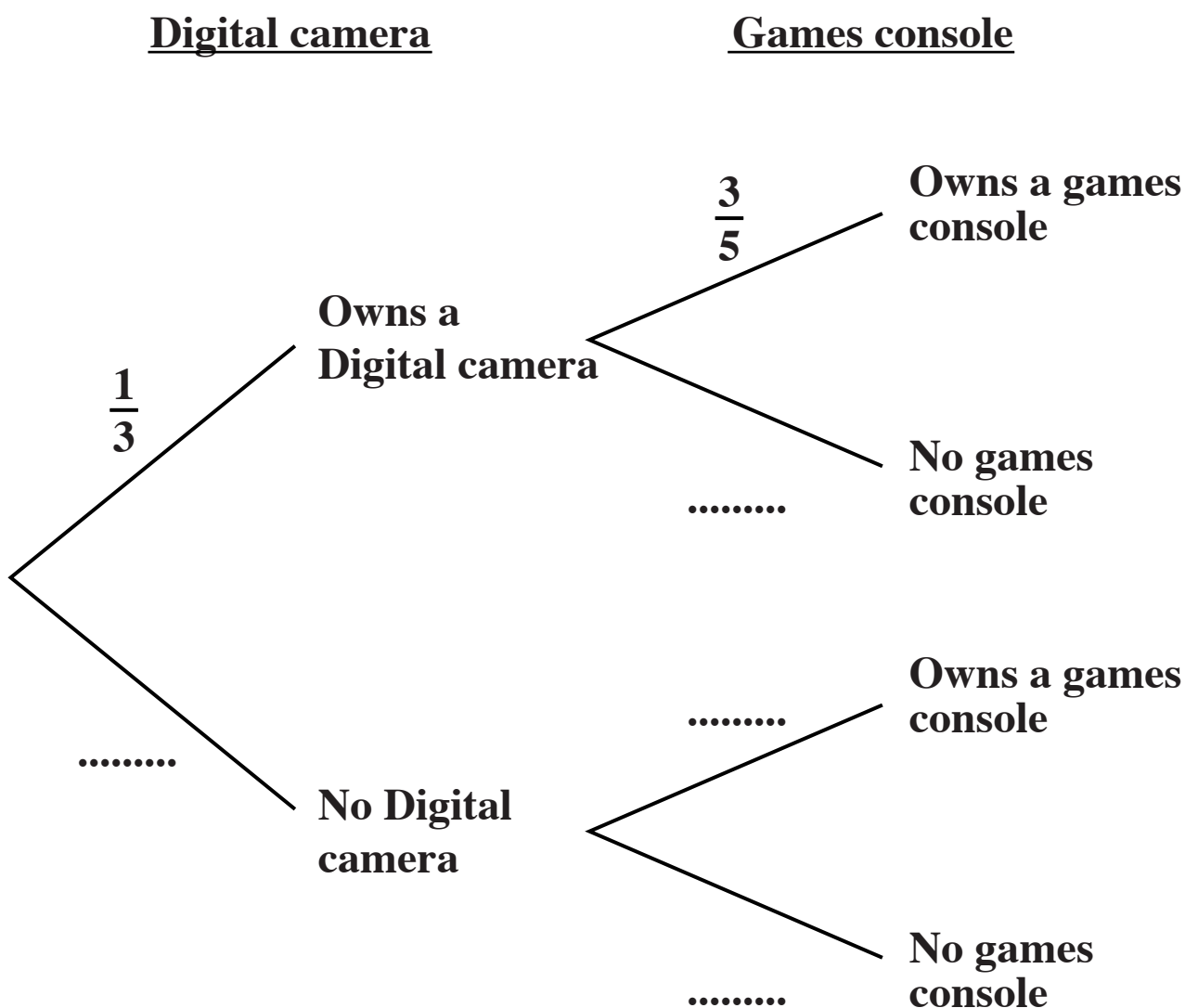
(d) \_\_\_\_\_

2 In a class, the probability that a pupil owns a digital camera is  $\frac{1}{3}$ .

For the same class, the probability that a pupil owns a games console is  $\frac{3}{5}$ .

These probabilities are independent.

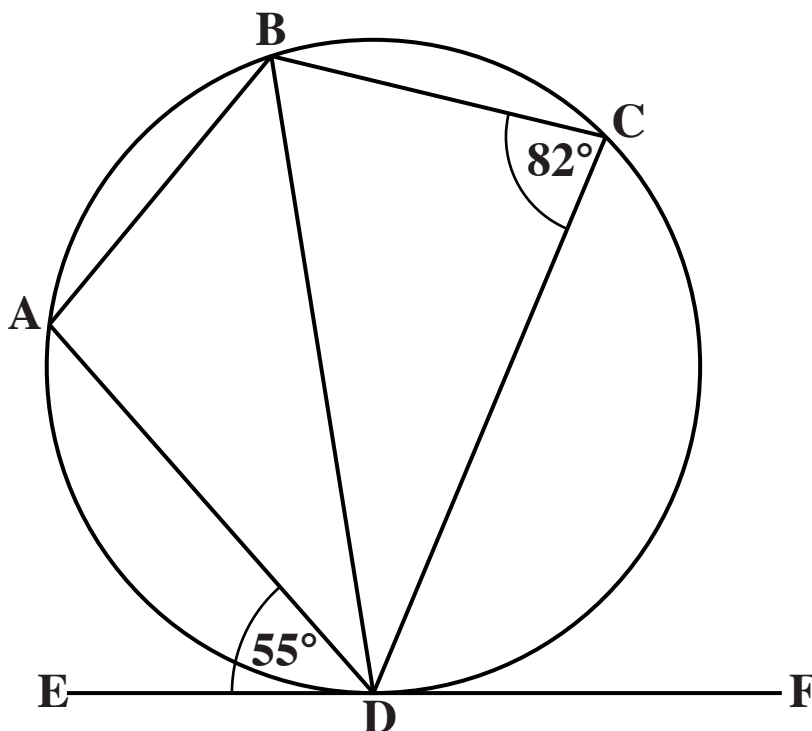
(a) Complete the probability tree diagram.  
[1 mark]



**(b) Calculate the probability that a pupil, chosen at random from the class, owns just one of these items.  
[3 marks]**

**(b)** \_\_\_\_\_

- 3 A, B, C and D are four points on a circle.  
 EF is the tangent to the circle at D.  
 Angle BCD =  $82^\circ$  and angle ADE =  $55^\circ$ .



Not to scale

- (a) Find angle BAD.  
 Give a reason for your answer.  
 [2 marks]

Angle BAD = \_\_\_\_\_ $^\circ$  because \_\_\_\_\_

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- (b) Find angle BDA.  
 Give a reason for each step of your answer.  
 [3 marks]

Angle BDA = \_\_\_\_\_ $^\circ$  because \_\_\_\_\_

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**4 (a) Expand and simplify.**

$$(4x + 3y)(x - 2y)$$

**[3 marks]**

**(a)** \_\_\_\_\_

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

$$x^2 - x - 20$$

**[2 marks]**

**(b)(i)** \_\_\_\_\_

**(ii) Hence simplify.**

$$\frac{x^2 - 25}{x^2 - x - 20}$$

**[2 marks]**

**(ii)** \_\_\_\_\_

**(c) Solve.**

$$2x^2 - 7x - 4 = 0$$

**[3 marks]**

**(c)** \_\_\_\_\_



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