

GENERAL CERTIFICATE OF SECONDARY EDUCATION
MATHEMATICS C (GRADUATED ASSESSMENT)
MODULE M9 – SECTION A

B279A

Candidates answer on the Question Paper

OCR Supplied Materials:
None

Other Materials Required:

- Geometrical instruments
- Tracing paper (optional)

Thursday 21 January 2010
Afternoon

Duration: 30 minutes



Candidate Forename		Candidate Surname	
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Centre Number							Candidate Number				
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INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- 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.
- Do **not** write in the bar codes.
- 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**.
- This document consists of **8** pages. Any blank pages are indicated.

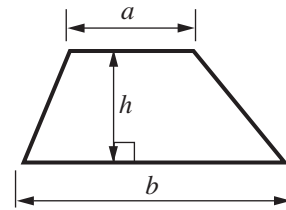
WARNING



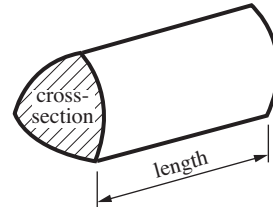
No calculator can be used for Section A of this paper

Formulae Sheet

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



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

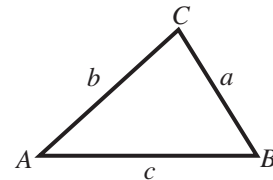


In any triangle ABC

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

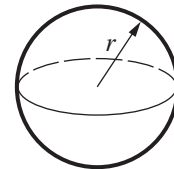
Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$

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



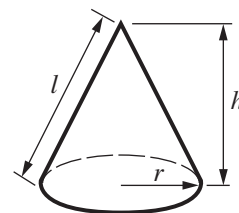
Volume of sphere = $\frac{4}{3}\pi r^3$

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

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

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1 Work out.

(a) 8^0

(a) [1]

(b) $3^{-2} \times 3^6$

(b) [2]

(c) $36^{\frac{1}{2}}$

(c) [1]

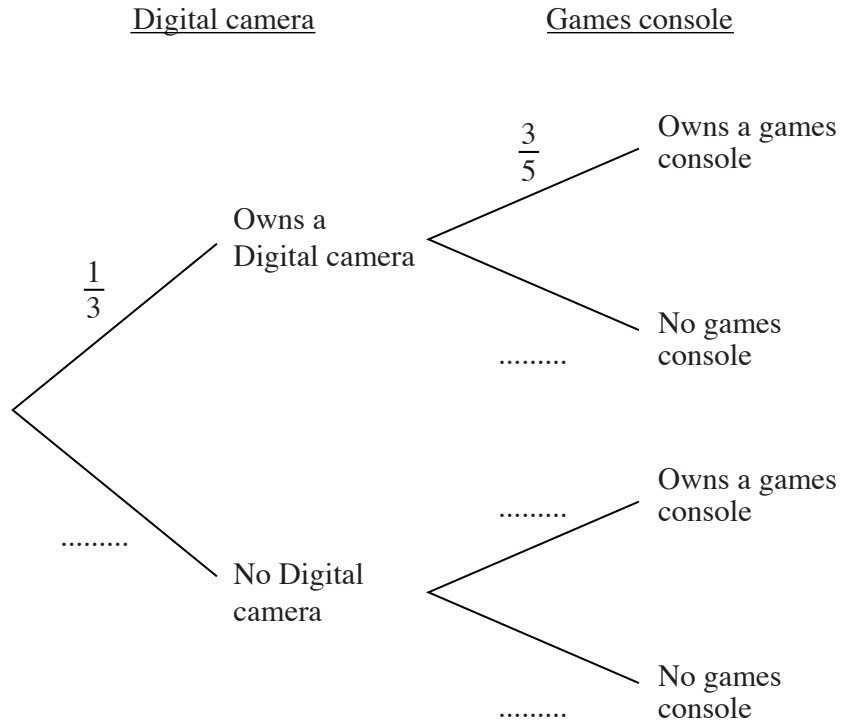
(d) $(6 \times 10^{11}) \times (5 \times 10^{-3})$

Give your answer in standard form.

(d) [2]

- 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.

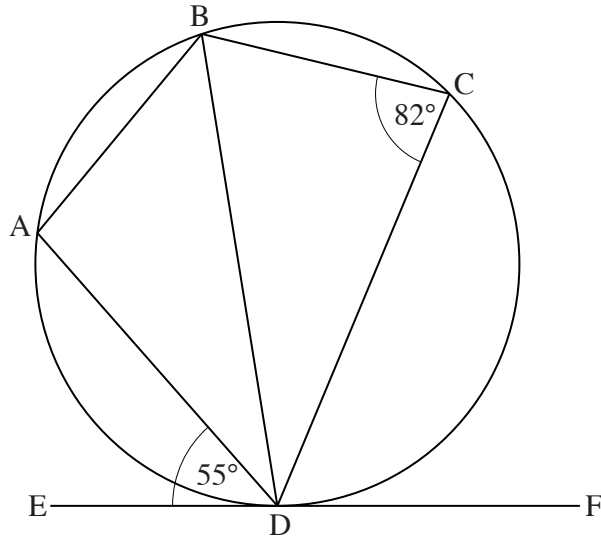
(a) Complete the probability tree diagram.



[1]

- (b) Calculate the probability that a pupil, chosen at random from the class, owns just one of these items.

(b) [3]



Not to scale

A, B, C and D are four points on a circle.
 EF is the tangent to the circle at D.
 Angle BCD = 82° and angle ADE = 55° .

- (a) Find angle BAD.
 Give a reason for your answer.

Angle BAD = $^\circ$ because
 [2]

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

Angle BDA = $^\circ$ because

 [3]

4 (a) Expand and simplify.

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

(a) [3]

(b) (i) Factorise.

$$x^2 - x - 20$$

(b)(i) [2]

(ii) Hence simplify.

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

(ii) [2]

(c) Solve.

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

(c) [3]

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