M9

OCR RECOGNISING ACHIEVEMENT

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)

Tuesday 1 March 2011
Morning

Duration: 30 minutes

Candidate forename		Candidate surname	

Centre number					Candidate number				

INSTRUCTIONS TO CANDIDATES

• Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
• Use black ink. Pencil may be used for graphs and diagrams only.
• Read each question carefully. Make sure you know what you have to do before starting your answer.
• Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
• 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.

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

Turn over

Formulae Sheet

Area of trapezium $= \frac{1}{2}(a + b)h$
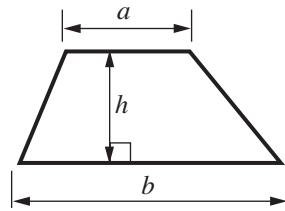
Volume of prism = (area of cross-section) × length
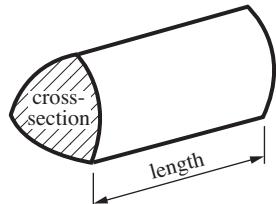
In any triangle *ABC*

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

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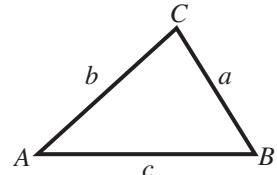
**Area of triangle** $= \frac{1}{2}ab \sin C$

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

Surface area of sphere $= 4\pi r^2$
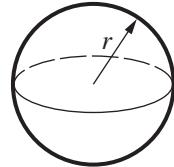
Volume of cone $= \frac{1}{3}\pi r^2 h$

Curved surface area of cone $= \pi r l$
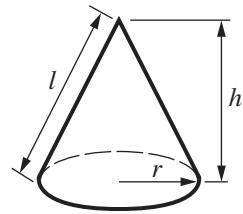
The Quadratic Equation

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

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

PLEASE DO NOT WRITE ON THIS PAGE

1 **(a)** Work out.

     (i) 9^0

<div align="right">

(a)(i)................................. **[1]**

</div>

     (ii) $64^{\frac{1}{2}}$

<div align="right">

(ii) .... **[1]**

</div>

    (iii) $(9 \times 10^{-8}) \times (2 \times 10^3)$

        Give your answer in standard form.

<div align="right">

(iii) .... **[2]**

</div>

  (b) What is the value of *n* in this equation?

     $3^n \div 3^{-2} = 3^6$

<div align="right">

(b) .... **[1]**

</div>

2   Kevin has two bags of coins.
Bag A contains three 2p coins and five 10p coins.
Bag B contains two 2p coins and one 10p coin.
Kevin picks one coin at random from bag A and then picks one coin at random from bag B.

(a) Complete the tree diagram.

<u>Bag A</u>   <u>Bag B</u>

$\frac{2}{3}$ 2p

....   10p

$\frac{3}{8}$ 2p

....   10p

....   2p

....   10p
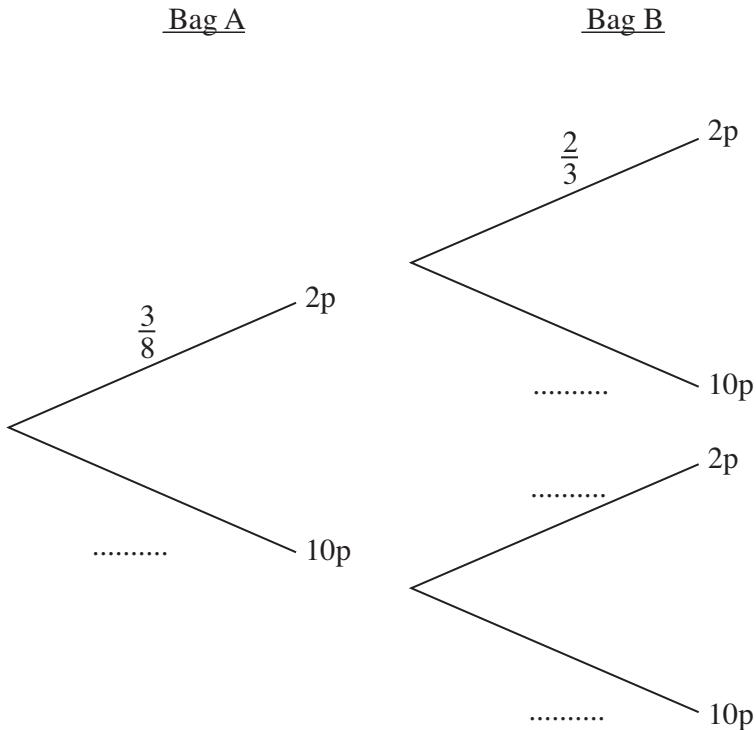
[1]

(b) Calculate the probability that he has picked a total of 12p.

(b) .... **[3]**

3 **(a)** Factorise fully.

$$12xy - 9y^2$$

(a).................................... **[2]**

(b) Solve by factorising.

$$2x^2 + 7x - 15 = 0$$

(b) .... **[3]**

Turn over

4   The histogram shows the distribution of the speeds, in miles per hour, of cars as they travel along a road in a one-hour period.
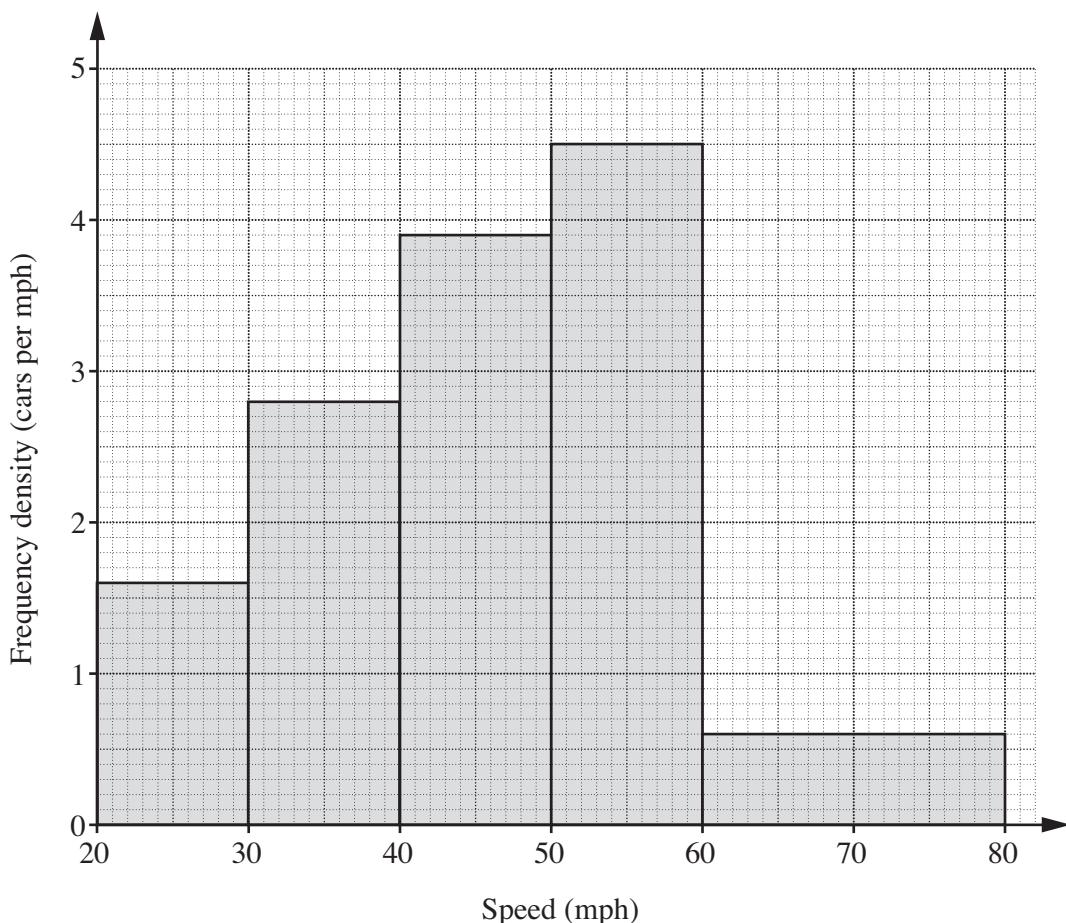
How many cars travelled along the road in this time?

.... **[3]**

5 The change in energy of a body is given by this formula.

$$E = \frac{mv^2 - mu^2}{2}$$

Rearrange the formula to make v the subject.

....[3]

TURN OVER FOR QUESTION 6

6 (a) Expand and simplify.

$$(3x + 2)(5x - 2)$$

(a)...................................... **[3]**

(b) Factorise.

$$9x^2 - 25y^2$$

(b) .... **[2]**

RECOGNISING ACHIEVEMENT