OCR
RECOGNISING ACHIEVEMENT

SPECIMEN

GENERAL CERTIFICATE OF SECONDARY EDUCATION

MATHEMATICS C
Higher Tier

TERMINAL PAPER – SECTION B

SPECIMEN

H **B282/B**

Candidates answer on the question paper.

Time: 1 hour

Additional Materials:
Geometrical instruments
Tracing paper (optional)
Scientific or graphical calculator

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

- You are expected to use a calculator in Section B of this paper.
- 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.
- Section B starts with Question 10.
- Use the π button on your calculator or take π to be 3·142 unless the question says otherwise.

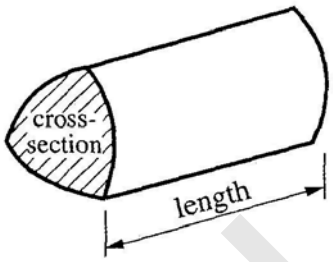
For Examiner's Use	
Section B	

This document consists of **16** printed pages.

  [Turn over

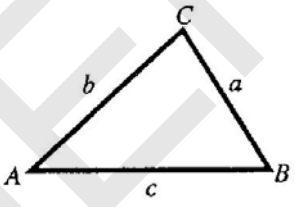
FORMULAE SHEET

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



In any triangle *ABC*

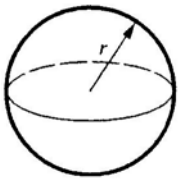
Sine rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$



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

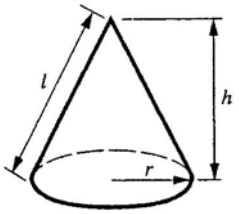
Area of triangle $= \frac{1}{2}ab\sin C$

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

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

10 Tamsin is making Shepherds Pie.

She uses this recipe.

Calculate the ingredients required for 10 servings.

_____ g minced beef

_____ onions

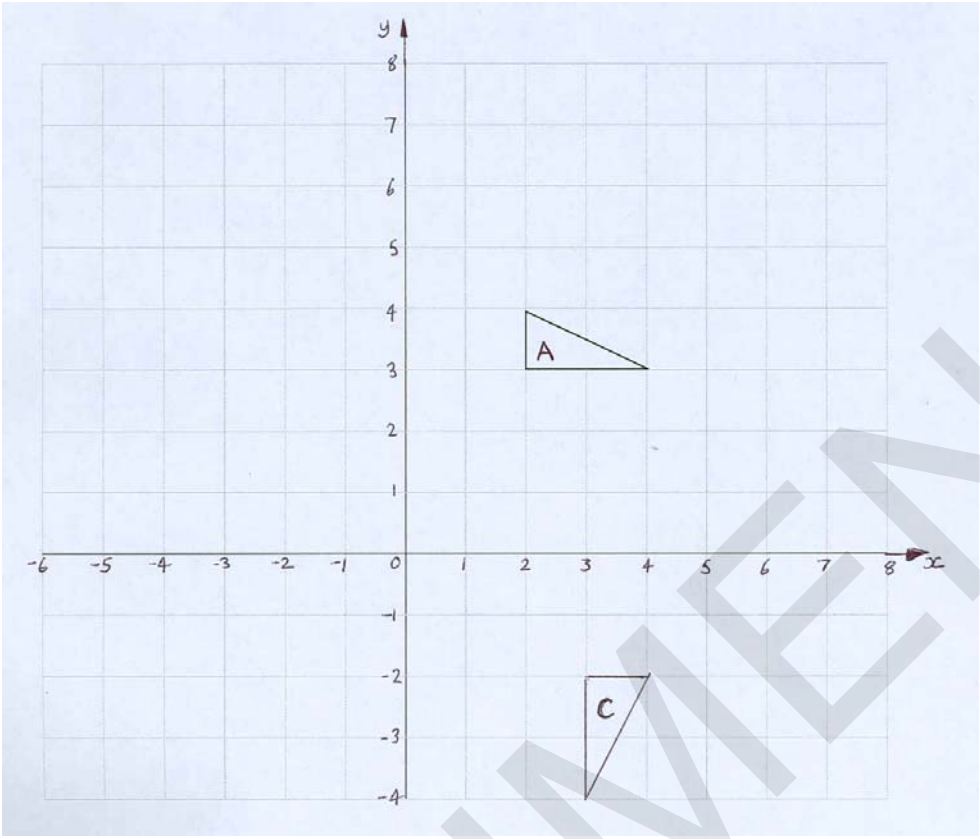
_____ kg potatoes

_____ ml stock [3]

3

[Turn over

11



(a) Reflect triangle **A** in the line $x = 5$.
Label your triangle **B**. [2]

(b) Describe in full the **single** transformation which maps triangle **A** onto triangle **C**.

---

[3]

(c) Translate triangle **A** by 6 squares left and 3 squares down.
Label your triangle **D**. [1]

6

12 **(a)** Write 36 as the product of prime factors.

(a) _____ [2]

(b) Find the lowest common multiple (LCM) of 36 and 48.

(b) _____ [2]

4

[Turn over

13 In a survey, 800 people were asked whether they travelled abroad last year.
This table summarises the results.

	Travelled abroad	Didn't travel abroad	Totals
Male	245	235	480
Female	144	176	320
Totals	389	411	800

(a) Calculate the percentage of people who took part in the survey who were male.

(a) _____ % [2]

(b) Calculate the percentage of females who had travelled abroad.

(b) _____ % [2]

(c) In the survey, people were also asked about their age.
Some people are offended if you ask their actual age.

Write a suitable question to obtain information about age without giving offence.

.....

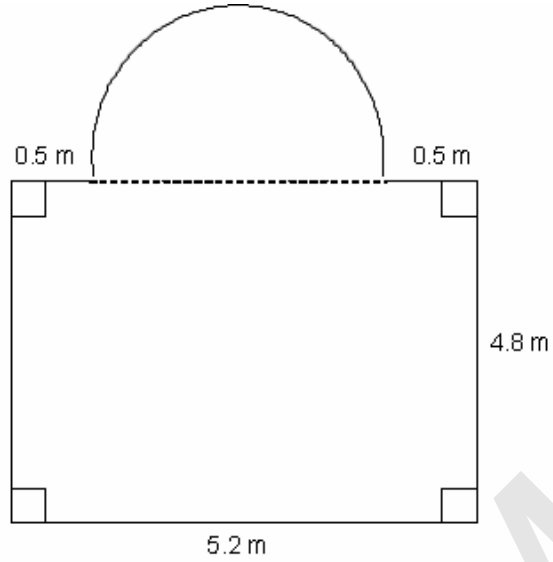
.....

.....

..... [2]

6

14



Not to Scale

The diagram shows the floor of Paul's bedroom.
The floor is a rectangle and a semicircle.

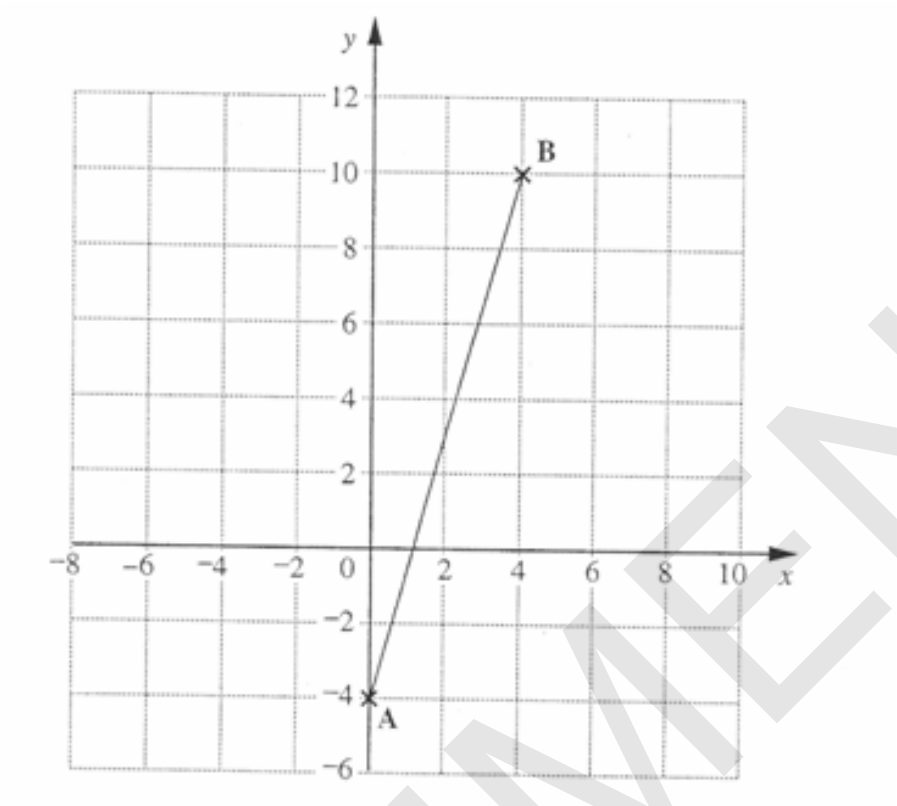
Calculate the total area of the floor.

..... m^2 [5]

5

[Turn over

15



A is the point (0, - 4) and B is the point (4, 10).

(a) **Calculate** the length of AB.
Show your working clearly.

(a) _____ [3]

15 (b) Find

(i) the gradient of the line through A and B,

(b)(i) _____ [2]

(ii) the equation of the line through A and B.

(ii) _____ [2]

7

16 Rearrange this formula to make P the subject.

$$A = \frac{\sqrt{2P}}{3}$$

_____ [3]

3

[Turn over

17 The population of a village is changing.
Planners use a formula to predict its population.
The formula is

$$P = 870 \times 0 \cdot 98^t$$

where P is the population and
t is the number of years after January 1st 2005.

(a) What is the population on January 1st 2005?

(a) _____ [1]

(b) Calculate the predicted population on January 1st 2008.

(b) _____ [2]

3

18 **(a)** Jamie cycles 12 miles at a steady speed of x mph and then 25 miles at a steady speed of $(x + 4)$ mph.

Write down an expression, in terms of x, for the **total** time that Jamie takes.

(a) _____ hours [2]

(b) The total time that Jamie takes is 2 hours.

Form an equation in x and show that it simplifies to $2x^2 - 29x - 48 = 0$.

[2]

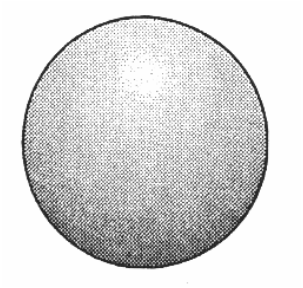
(c) Solve the equation $2x^2 - 29x - 48 = 0$ to find the speed x mph.

(c) _____ mph [3]

7

[Turn over

19 A whole cheese is made in the shape of a sphere.
The volume of the sphere is 5000 cm^3.

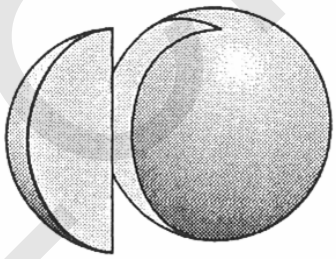


(a) Show that the radius of the sphere is approximately 10·6 cm.

[2]

(b) The cheese is sliced through the centre to make 20 identical pieces.

Calculate the **total** surface area of one of the pieces.



(b) _____ cm^2 [4]

6

Section B Total [50]

Oxford Cambridge and RSA Examinations

General Certificate of Secondary Education

MATHEMATICS C B282/B

TERMINAL PAPER – SECTION B (Higher Tier)

Specimen Mark Scheme

The maximum mark for this paper is 50.

This document consists of **4** printed pages.

10		500g minced lamb 5 onions 2kg potatoes 750ml stock	**B3**	**3**		B2 1 error B1 2 errors
11	**(a)** **(b)** **(c)**	Correct reflection Rotation, 90° clockwise centre (0,0) D correct	**B2** **B1** **B1** **B1** **B1**	**6**		M1 for indication of $x = 5$, or for correct orientation Or -90°
12	**(a)** **(b)**	2^2 x 3^2 or 2x2x3x3 144	**B2** **B2**	**4**		B1 2^2 or 3^2 B1 2x2x2x2x3 seen
13	**(a)** **(b)** **(c)**	$\frac{480}{800}[\times 100] = 60\%$ $\frac{144}{320}[\times 100] = 45\%$ polite, clear unbiased question asking for age range list of categories covering age range without overlap	**M1A1** **M1A1** **W1** **W1**	**6**		
14		31.8 – 31.9 cm^2	**M3A2**	**5**		M1 4.8 x 5.2 A1 24.96 M1 (5.2–0.5–0.5)÷2=2.1(r) M1 (their 2.1)^2 x3.14(…..)÷2 Accept 32 from valid method seen
15	**(a)** **(c)(i)** **(ii)**	14.56 (….) or 14.6 3.5 $y = 3.5x - 4$ oe	 **M2A1** **M1A1** **M1A1**	**7**		M1 Use of Pythagoras 14^2+14^2 M1 square root of M1 14/4 B1 gradient or intercept correct
16		$P = \frac{9A^2}{2}$ or $\frac{(3A)^2}{2}$ o.e.	**W3**	**3**		M1 for each of 3 relevant correct steps in rearranging: multiplying, squaring, dividing, ft from previous errors
17	**(a)** **(b)**	870 819	**B1** **M1A1**	**3**		M1 870 x 0.98^3

18	**(a)** **(b)** **(c)**	$12/x + 25/(x + 4)$ equating and multiplication by $x(x + 4)$ correctly obtaining given answer 16	**B1B1** **M1** **A1** **M2A1**	**7**		M1 $(2x + 3)(x – 16) = 0$ or quadratic formula used M1 $x = -3/2$ or 16
19	**(a)** **(b)**	convincing steps shown 423 – 424 cm^2	**B2** **M2A2**	**6**		B1 1193. (…..) seen M1 SA ÷ 20 (70.5 …) M1 $3.14(\ldots)x10.6^2(352.98\ldots..)$

Section B Total 50

Assessment Objectives Grid

Question	AO2	AO3	AO4	Total
10	3			**3**
11		6		**6**
12	4			**4**
13			6	**6**
14		5		**5**
15	4	3		**7**
16	3			**3**
17	3			**3**
18	7			**7**
19		6		**6**
Totals	**24**	**20**	**6**	**50**