



Cambridge International Examinations
Cambridge International General Certificate of Secondary Education (9–1)

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER



MATHEMATICS

0626/06

Paper 6 (Extended)

For Examination from 2017

SPECIMEN PAPER

2 hours

Candidates answer on the Question Paper.

Additional Materials: Geometrical instruments
Tracing paper (optional)

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name in the spaces at the top of this page.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams and graphs.

Do not use staples, paper clips, glue or correction fluid.

DO NOT WRITE IN ANY BARCODES.

Answer **all** questions.

Electronic calculators should be used.

If working is required for any question it must be shown below that question.

If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.

For π , use either your calculator value or 3.142.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [] at the end of each question or part question.

The total of the marks for this paper is 96.

This syllabus is regulated in England as a Cambridge International Level 1/Level 2 (9–1) Certificate.

This document consists of **14** printed pages.

- 1 A family of 2 adults and 3 children is on holiday in France.
Each person hires a mountain bike from the hotel.
The costs in Euros (€) to hire the mountain bikes are shown in the table.

1 Euro = £0.82

| Large mountain bike | | Small mountain bike | |
|---------------------|-----------------|---------------------|-----------------|
| First hour | Each extra hour | First hour | Each extra hour |
| €6 | €2 | €3.60 | €1.20 |

- (a) The family hires 2 large and 3 small mountain bikes for 5 hours.
The family has to pay an extra 5% because they pay with their credit card.
The credit card has an exchange rate of €1 = £0.90.

Work out the cost in pounds of hiring 2 large and 3 small mountain bikes for 5 hours.

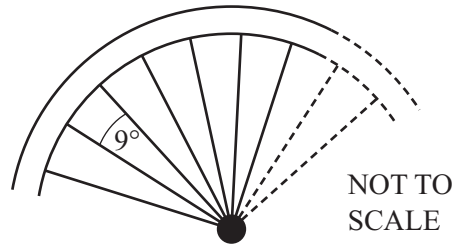
£..... [6]

- (b) The family crosses a bridge which is 24 m long.
A wheel of a large bike has a radius of 32 cm.

Calculate how many **complete** turns a wheel of a large bike makes to cross the bridge.

..... [4]

- (c) The diagram shows part of a wheel of a large bike.
The angle between each pair of metal spokes is 9° .
Each spoke is 29 cm long.



Calculate the total length of metal, in metres, needed to make the spokes for one wheel.

..... m [3]

2 Nema flies from Hong Kong to Johannesburg.

- (a) (i) The distance from Hong Kong to Johannesburg is 10 712 km.
The time taken for the journey is 13 hours and 25 minutes.

Calculate the average speed of the plane for this journey.

..... km/h [2]

- (ii) The plane uses fuel at the rate of 1 litre for every 59 metres travelled.

Calculate the number of litres of fuel used for the journey from Hong Kong to Johannesburg.
Give your answer in standard form.

..... litres [4]

- (b) The cost of Nema's journey is 10 148 South African Rand (R).
This is an increase of 18% on the cost of the same journey one year ago.

Calculate the cost of the same journey one year ago.

R [3]

- 3 (a) (i) Eduardo invests £640 at a rate of 2% per year compound interest.

Show that, at the end of 6 years, Eduardo has £721, correct to the nearest pound.

[2]

- (ii) Manuela also invests £640.
At the end of 4 years, Manuela has £721.

Find the yearly compound interest rate.

.....% [4]

- (b) Carlos buys a motor scooter for £1200.
Each year the value of the scooter decreases by 10% of its value at the beginning of that year.

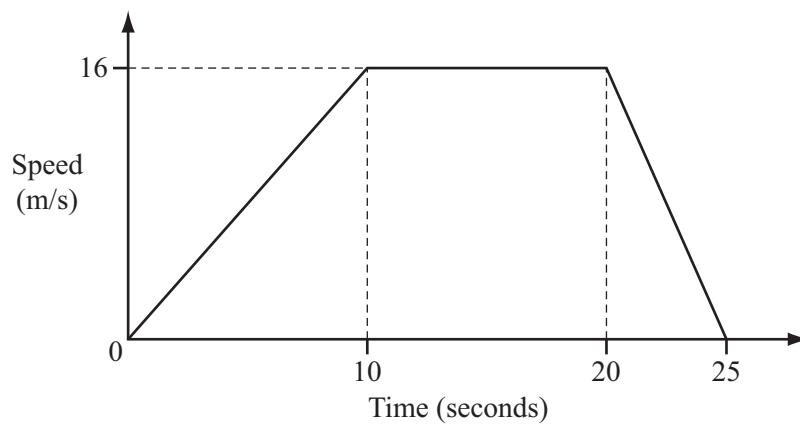
Find the value of the scooter after 3 years.

£..... [2]

- 4 (a) Rearrange $s = ut + \frac{1}{2}at^2$ to make a the subject.

$a = \dots\dots\dots$ [3]

- (b) The diagram shows the speed-time graph for a car travelling between two sets of traffic lights.



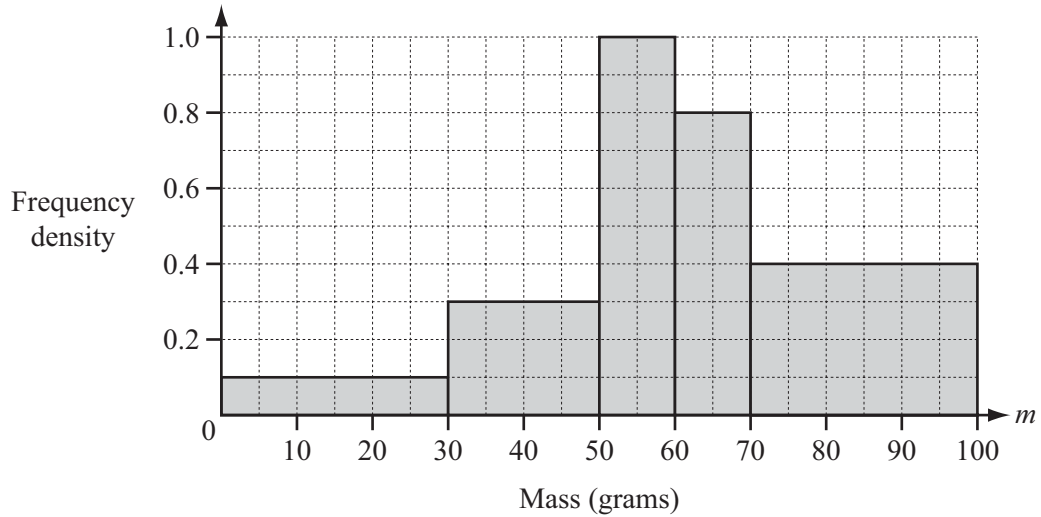
- (i) Calculate the deceleration of the car for the last 5 seconds of the journey.

$\dots\dots\dots$ m/s^2 [1]

- (ii) Calculate the distance between the two sets of traffic lights.

$\dots\dots\dots$ m [3]

5 (a)



The histogram shows some information about the masses (m grams) of 39 apples.

(i) Show that there are 12 apples in the interval $70 < m \leq 100$.

[1]

(ii) Calculate an estimate of the mean mass of the 39 apples.

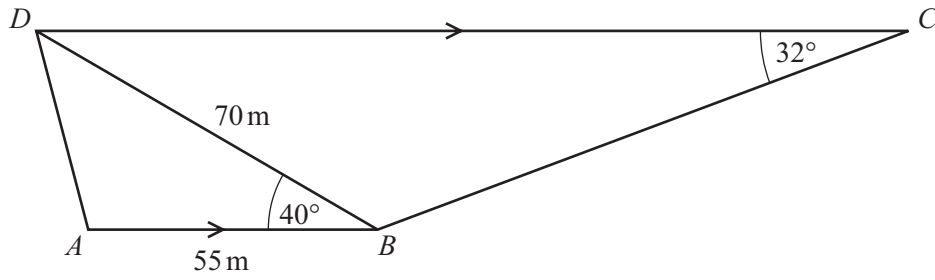
..... g [5]

(b) The mean mass of 20 oranges is 70 g.
One orange is eaten.
The mean mass of the remaining oranges is 70.5 g.

Find the mass of the orange that was eaten.

..... g [3]

6

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SCALE

The diagram shows a school playground $ABCD$.

$ABCD$ is a trapezium.

$AB = 55\text{ m}$, $BD = 70\text{ m}$, angle $ABD = 40^\circ$ and angle $BCD = 32^\circ$.

(a) Calculate AD .

$AD = \dots\dots\dots\text{ m [4]}$

(b) Calculate BC .

$BC = \dots\dots\dots\text{ m [4]}$

(c) Calculate the area of the playground $ABCD$.

..... m^2 [3]

(d) A fence, BD , divides the playground into two parts.

Calculate the shortest distance from A to BD .

..... m [2]

7 A curve has equation $y = x^3 - 6x^2 + 16$.

(a) Find the co-ordinates of the two turning points.

(.....,) and (.....,) [6]

(b) Determine whether each of the turning points is a maximum or a minimum.
Give reasons for your answers.

.....
..... [3]

- 8 (a) The line $x + y = 2$ intersects the circle $x^2 + y^2 = 34$ at the points A and B . Find the co-ordinates of the points A and B .

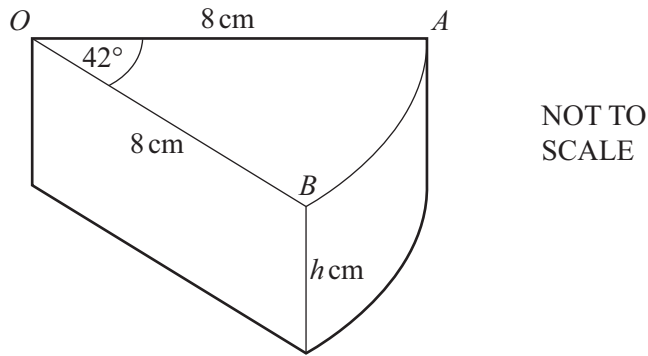
(.....,) [6]

(.....,) [6]

- (b) Show that the length of the line AB is $8\sqrt{2}$ units.

[2]

9



The diagram shows a wedge of cheese cut from a cylinder of height h cm. The wedge of cheese is a prism.

The radius of the cylinder, OA , is 8 cm and the angle $AOB = 42^\circ$.

(a) (i) The volume of the wedge of cheese is 90 cm^3 .

Show that the value of h is 3.84 cm correct to 2 decimal places.

[4]

(ii) Calculate the **total** surface area of the wedge of cheese.

..... cm^2 [5]

- (b) A mathematically similar wedge of cheese has a volume of 22.5 cm^3 .

Calculate the height of this wedge.

..... cm [3]

Question 10 is printed on the next page.

10 (a) Find an expression for the n th term of the following sequence.

1, 2, 4, 8, 16,

..... [2]

(b) A sequence of diagrams is formed by drawing equilateral triangles with sides that measure one centimetre.

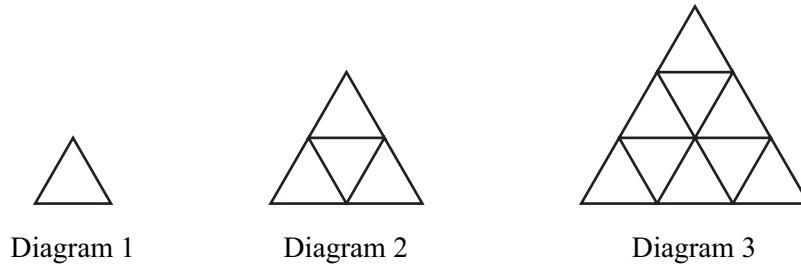


Diagram 1 has 3 one-centimetre lines.
 Diagram 2 has 9 one-centimetre lines.

The expression for the **total** number of one-centimetre lines needed to draw **all of the first n diagrams** is

$$an^3 + bn^2 + n.$$

Find the value of a and the value of b .

$a =$

$b =$ [6]

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