

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

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0626/02

May/June 2017

1 hour

Additional Materials: Geometrical instruments
Tracing paper (optional)

READ THESE INSTRUCTIONS FIRST

DO **NOT** WRITE IN ANY BARCODES.

For π , use either your calculator value or 3.142.

The total of the marks for this paper is 60.

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

This document consists of **12** printed pages.

- 1 The table shows the relative frequency of the medals awarded in a national mathematics competition.

Medal	None	Bronze	Silver	Gold
Relative frequency	0.35	0.4		0.1

- (a) Complete the table. [2]

- (b) 120 students from one school entered the competition.

Work out the expected number of bronze medals awarded to these students.

..... [1]

- 2 Simplify.

(a) $m^0 \times m^3$

..... [1]

(b) $(y^4)^{-2}$

..... [1]

(c) $\frac{3x^6y^4}{21x}$

..... [2]

- 3 Write down an irrational number between 6 and 7.

..... [1]

4 Calculate.

$$\frac{\sqrt{7.4^3 + 562}}{\tan 88^\circ - 25}$$

Give your answer correct to 3 decimal places.

..... [2]

5 The length, l metres, of a piece of rope is 13.2 metres correct to 1 decimal place.

(a) Complete the following statement about l .

..... $\leq l <$ [2]

(b) A water wheel has radius 2.1 metres.

Show that the rope may not be long enough to fit around the circumference of the wheel.

[3]

- 6 Asim takes 45 minutes to travel along a road.
On a map, the road measures 8.4 cm.
The scale of the map is 1:150 000.

(a) Work out Asim's average speed in kilometres per hour.

..... km/h [4]

(b) Rosie says:

At that speed, Asim cannot be driving a car.

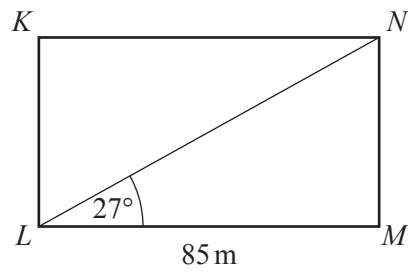
Comment on Rosie's statement.

.....
..... [1]

- 7 The number 2017 can be written as the sum of two square numbers.
One of the square numbers is less than 100.

Complete the sum.

2017 = + [2]



NOT TO
SCALE

The diagram shows a rectangle $KLMN$.

(a) Calculate LN .

$LN = \dots\dots\dots$ m [3]

(b) Calculate the shortest distance from M to the line LN .

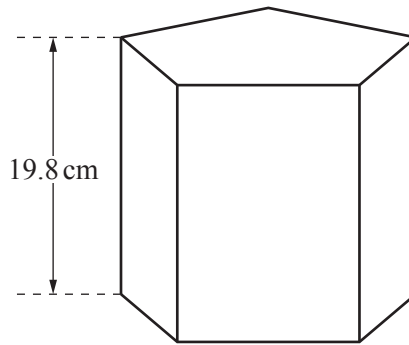
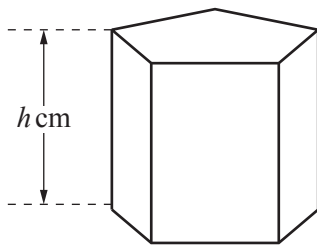
$\dots\dots\dots$ m [3]

- 9 An airline reduces its baggage allowance by 15%.
The new baggage allowance is 34 kg.

Work out the original baggage allowance.

..... kg [3]

10



NOT TO
SCALE

Two solids are mathematically similar.

The volume of the small solid is 1500 cm^3 .

The volume of the large solid is 2592 cm^3 .

The height of the small solid is $h \text{ cm}$.

The height of the large solid is 19.8 cm .

Calculate the value of h .

$h =$ [3]

- 11 The table shows some information about the students in a school.

Year	Girls	Boys	Total
9	58	46	104
10	50	38	88
11	54	62	116
Total	162	146	308

The Head Teacher of the school carries out a survey of his students.
He takes a stratified sample of 50 of these students.

Work out how many Year 11 girls he should include in the sample.

..... [2]

- 12 w is inversely proportional to the cube of t .
 $w = 50$ when $t = 2$.

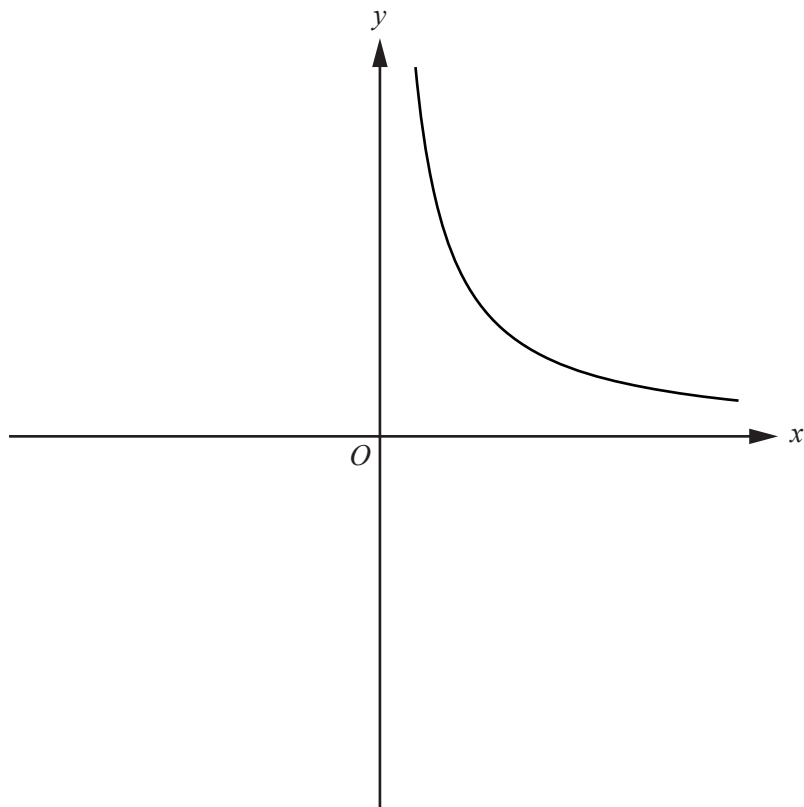
(a) Find w when $t = 5$.

$w =$ [3]

(b) Find t when $w = 0.4$.

$t =$ [1]

- 13 (a) This is part of a **sketch** graph of $y = \frac{1}{x}$.



On the axes above, complete the **sketch** graph of $y = \frac{1}{x}$. [1]

- (b) Write down the equations of the asymptotes of the graph of $y = \frac{1}{x}$.

..... [2]

14 $f(x) = 3x - 2$

(a) Work out $ff(5)$.

..... [2]

(b) Find $f^{-1}(x)$.

$f^{-1}(x) =$ [2]

(c) Simplify $ff^{-1}(x)$.

$ff^{-1}(x) =$ [1]

15 Rachael has drawn the graph of $y = x^2 - 2x + 6$.

Write down the equation of the line she should draw on her graph to solve $x^2 - 5x + 6 = 0$.

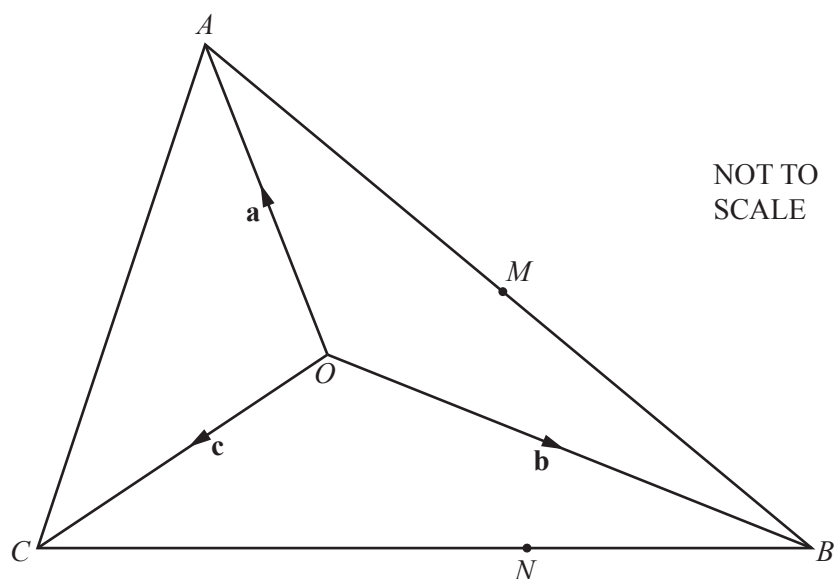
$y =$ [1]

- 16 The area of an equilateral triangle is 25 cm^2 .

Find the perimeter of this triangle.

..... cm [3]

17



The point O lies inside the triangle ABC .

$\overrightarrow{OA} = \mathbf{a}$, $\overrightarrow{OB} = \mathbf{b}$ and $\overrightarrow{OC} = \mathbf{c}$.

M is the midpoint of AB .

$BN = \frac{1}{2}NC$.

Find $\overrightarrow{MN}$ in terms of $\mathbf{a}$, $\mathbf{b}$ and $\mathbf{c}$.

Give your answer in its simplest form.

$\overrightarrow{MN} = \dots\dots\dots$ [4]

Question 18 is printed on the next page.

18 Make x the subject of this formula.

$$k = \frac{x^2}{2x - t}$$

Give your answer in its simplest form.

..... [4]

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