Cambridge Assessment International Education

Mathematics

Stage 8

Paper 1 **2022**

Cambridge Lower Secondary Progression Test

Name

Class

Date

1 hour

Additional materials: Geometrical instruments
Tracing paper (optional)

INSTRUCTIONS

- Answer **all** questions.
- Write your answer to each question in the space provided.
- You should show all your working on the question paper.
- You are **not** allowed to use a calculator.

INFORMATION

- The total mark for this paper is 50.
- The number of marks for each question or part question is shown in brackets [ ].

1 The probability Naomi will win her tennis match is 0.3

Find the probability Naomi will **not** win her tennis match.

..... [1]

2 Write a number in each box to make each statement correct.

$8^0 = \square$

$8^{15} \div 8^5 = 8^{\square}$

[2]

3 Work out.

$\sqrt[3]{-64}$

..... [1]

4 32 km = x miles, correct to the nearest mile.

Work out the value of x.

$x =$ ..... [1]

5 Write this ratio in its simplest form.

$0.2\,\text{m} : 17\,\text{cm}$

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

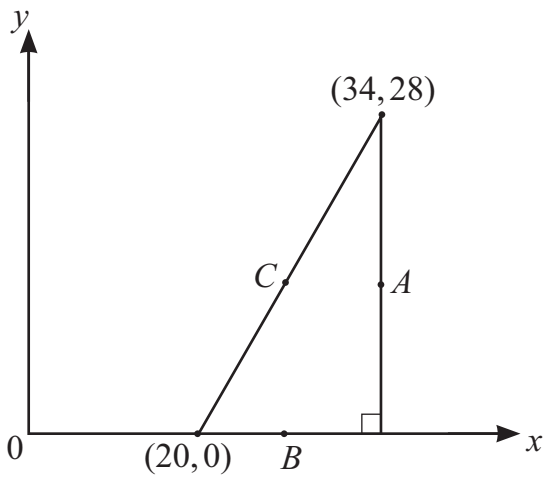
6 Work out.

$$\frac{6}{7} \times \left(\frac{4}{5} - \frac{1}{3} \right)$$

Give your answer as a fraction in its simplest form.

..... [2]

7 The diagram shows a right-angled triangle.
Two of the vertices are at $(34, 28)$ and $(20, 0)$.



NOT TO SCALE

The midpoints of the sides of the triangle are A, B and C.

Find the coordinates of A, B and C.

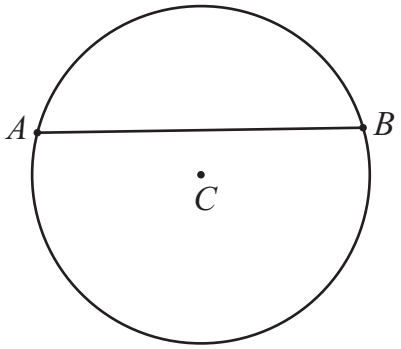
$A = ($ ..... , ... $)$

$B = ($ ..... , ... $)$

$C = ($ ..... , ... $)$

[2]

8 Here is a diagram of a circle, centre C, with a chord AB.



Write these lengths in order of size, starting with the shortest.

circumference chord AB diameter radius

....

shortest longest

[1]

9 Find the value of each expression when $e = -5,\ f = 7,\ g = 3$

$e\,(f - g)$

.....

$(f + g)^2$

.....

$3e^2 - 4$

.....

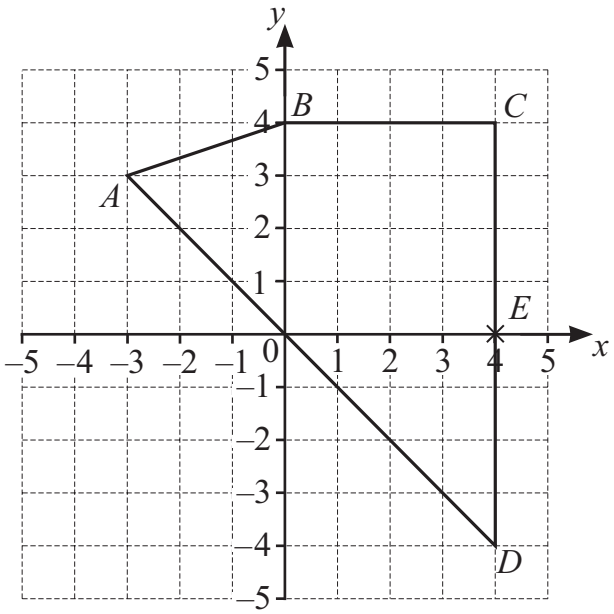
[3]

10 Draw a ring around **each** inequality that is equivalent to $x > 5$

$x - 1 > 4$ $\quad$ $5 > x$ $\quad$ $2x > 10$ $\quad$ $x \geq 4$ $\quad$ $5 < x$

[1]

11 The quadrilateral $ABCD$ is drawn on the grid and point E is $(4, 0)$.



(a) Write down the equation of a line that is parallel to CD.

..... [1]

(b) Rajiv draws the line $y = 5x + 4$

Draw a ring around the point that this line passes through.

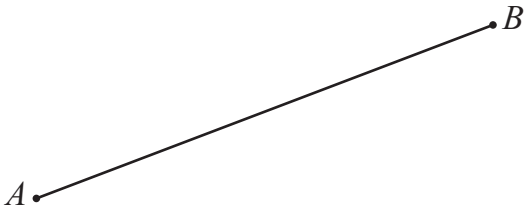
A $\quad$ B $\quad$ C $\quad$ D $\quad$ E

[1]

(c) Write down the equation of the line that passes through A **and** D.

..... [1]

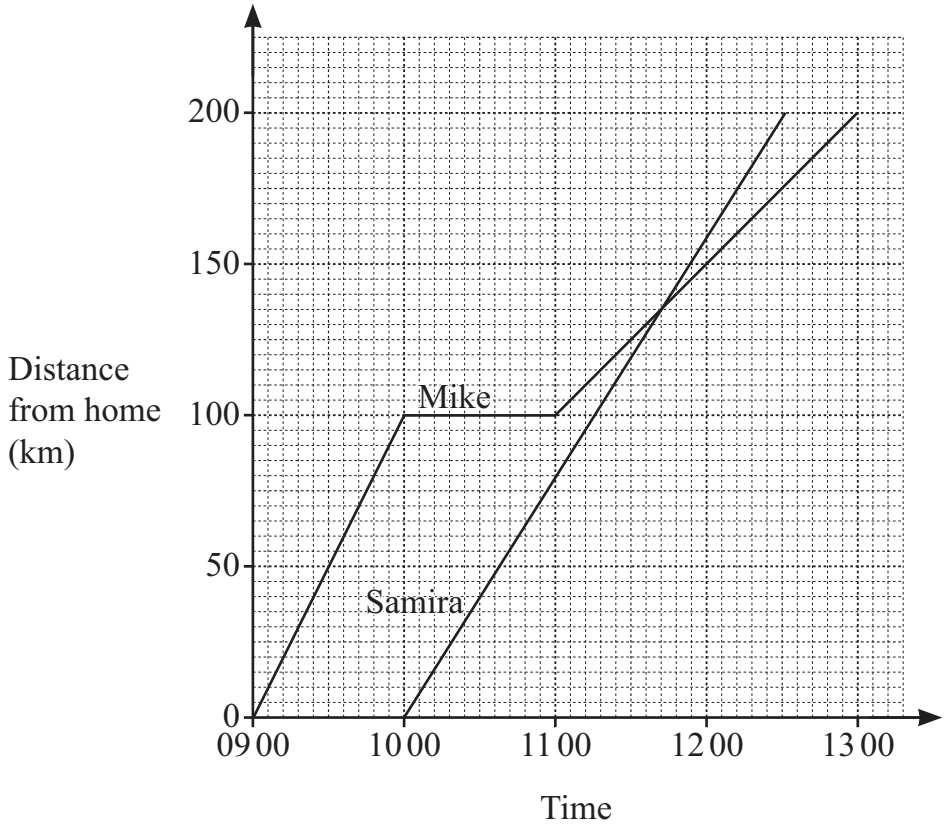
12 Here is a line AB.



Using a ruler and compasses only, construct the perpendicular bisector of AB.
Do **not** rub out your construction arcs.

[2]

13 Mike and Samira travel from home to visit a friend.
The distance–time graph shows information about their journeys.



Mike and Samira live in the same house and travel along the same route to visit their friend.

Complete these sentences.

Samira leaves home ..... minutes after Mike.

Samira passes Mike at the time ..... at a distance of ..... km from home.

[2]

14 **(a)** Here are four sequences A, B, C and D.

A 2, 5, 8, 11, …

B 3, 6, 12, 24, …

C 1, 5, 25, 125, …

D 20, 10, 0, –10, …

Write the letter for each sequence in the correct place in the table.
The first one has been done for you.

The term-to-term rule is add *k* or subtract *k* where *k* is a whole number	**The term-to-term rule is multiply by *k* where *k* is a whole number**
A	

[1]

(b) The nth term of sequence E is $4n - 1$

Find the 200th term of sequence E.

..... [1]

15 Work out.

$$4 \times 1\frac{7}{12}$$

Give your answer as a mixed number in its simplest form.

..... [2]

16 Safia owns a gym.
She wants to survey members to find out if they are happy with the gym.

(a) Put a tick (✓) next to the method of sampling that is likely to give the fairest results.

Ask every member who comes to the gym on Tuesday morning.	☐
Use a random number generator to generate 50 membership numbers and ask members with those numbers.	☐
Ask every 10th member who comes to the gym during one week.	☐
Call all members who haven't been to the gym for a month to ask them.	☐

[1]

(b) Safia gives this question to some members of the gym.

> Draw a ring around the score that represents how happy you are at the gym.
>
> 1 2 3 4 5 6 7 8 9 10
>
> not happy very happy

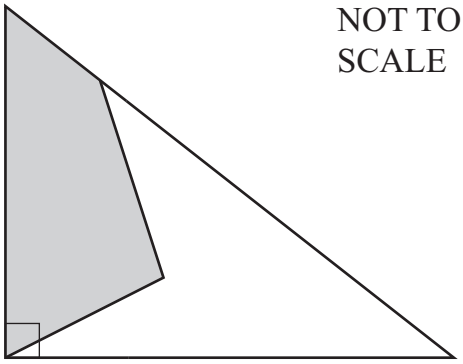
Safia asks 10 members to answer this question.
The mean score for the 10 members is 8.5
Her conclusion is that most members of her gym are happy.

Give one reason why her conclusion may **not** be true.

.....

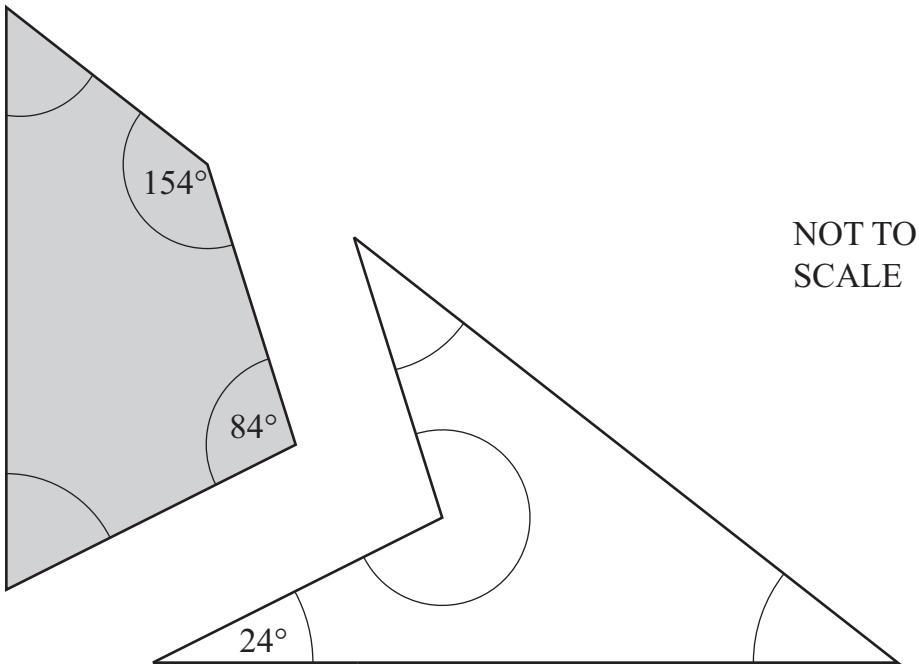
..... [1]

17 The diagram shows a right-angled triangle.



NOT TO SCALE

The triangle is cut into two quadrilaterals.



NOT TO SCALE

Work out the size of all of the **five** missing angles.
Write them in the correct place in each quadrilateral.

[3]

18 Pierre writes down a three-digit number using **three** of the digit cards.

The first two digits of his number are even and the last digit is odd.

Write a list of **all** the possible three-digit numbers Pierre could write.

.....

..... [2]

19 Work out.

(a) 3.85×-7

..... [1]

(b) $0.72 \div 0.8$

..... [1]

20 Here are some numbers written in order of size.

$$\frac{9}{20} < x < 0.5 < y < \frac{7}{12}$$

Complete these sentences.

x is a **decimal** and a possible value of x is .....

y is a **fraction** and a possible value of y is .....

[2]

21 Point A has coordinates $(-4, 3)$.

Point A is reflected in the line $y = 2$

Find the coordinates of the image of point A.

(....., ...) [1]

22 The table gives some information about 3D shapes that are all polyhedra.

Number of vertices	Number of faces	Number of edges
4	4	6
12		30
v	f	

Complete the table.
You will need to write an expression in terms of v and f in the last row.

[2]

23 Here is a pattern using square numbers.

$1001^2 = 1\,002\,001$

$1002^2 = 1\,004\,004$

$1003^2 = 1\,006\,009$

$1004^2 = 1\,008\,016$

$1005^2 = 1\,010\,025$

$1006^2 = 1\,012\,036$

Use the pattern to complete these statements.

$1007^2 =$ .....

$\sqrt{1018081} =$ .....

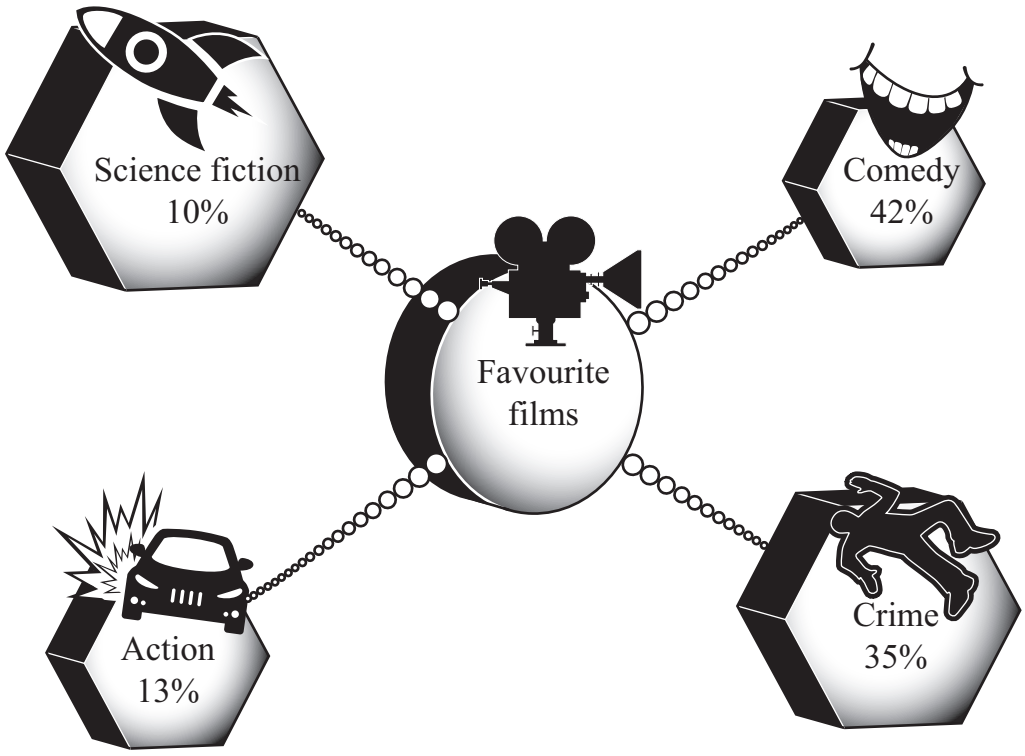
$1012^2 =$ .....

[2]

24 Find the value of x when $36 \times 56 = 2^x \times 3^2 \times 7$

$x =$ ..... [2]

25 A group of adults are asked to choose their favourite film type.
Mia makes this infographic showing information about the results.



Write a criticism of Mia's infographic.

.....

..... [1]

26 Work out the absolute change when 45 is decreased by 300%.

..... [2]

27 Here is an equation.

$$5 - g = 6 - h$$

Find which of g and h is greater.
Work out how much greater it is.

..... is greater by ..... [1]

28 An expression for the area of this right-angled triangle is $6y^2 - 15y$

NOT TO SCALE

Find an expression for the perpendicular height of the triangle.

..... [2]