GradeMax

Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME

CENTRE NUMBER | | | | | |

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2760866349

MATHEMATICS **0580/23**

Paper 2 (Extended) **October/November 2022**

1 hour 30 minutes

You must answer on the question paper.

You will need: Geometrical instruments

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You should use a calculator where appropriate.
- You may use tracing paper.
- You must show all necessary working clearly.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.
- For π, use either your calculator value or 3.142.

INFORMATION

- The total mark for this paper is 70.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **12** pages.

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[Turn over

1 Marco starts work at 20 45 and finishes at 02 08 the next day.

Find the length of time, in hours and minutes, he works.

..... h ..... min [1]

2

120 121 149 164 216

From this list, write down

(a) a square number

..... [1]

(b) a cube number.

..... [1]

3 Calculate.

$$\sqrt{15} + \frac{4.8}{2.2}$$

..... [1]

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4 The mean mass of four men in a rowing team is 97.5 kg.
The modal mass is 101 kg.
The range of the masses is 8 kg.

Find the mass of each of the four men.

..... kg , ... kg , ... kg, ... kg [3]

5 **Without using a calculator**, work out $\frac{5}{7} - \frac{2}{3}$.

You must show all your working and give your answer as a fraction in its simplest form.

..... [2]

6 A spinner can land on the colours green, black or red.
The table shows the probabilities of the spinner landing on green or black.

Colour	Green	Black	Red
Probability	$\frac{2}{5}$	$\frac{1}{4}$	

(a) Complete the table. [2]

(b) Chang spins the spinner 120 times.

Find the expected number of times it lands on green.

..... [1]

7 Find the lowest common multiple (LCM) of 36 and 60.

..... [2]

8 A is the point $(-3, 5)$ and B is the point $(5, 2)$.

Find the coordinates of the midpoint of the line AB.

(..... , ...) [2]

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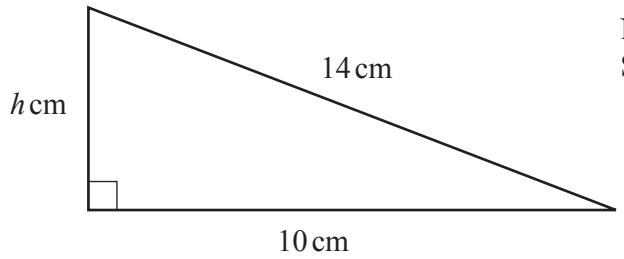
9 Solve the simultaneous equations.

$$3x - 2y = 21$$
$$5x + 2y = 51$$

$x =$ .....

$y =$ ..... [2]

10



NOT TO SCALE

The diagram shows a right-angled triangle.

(a) Calculate the value of h.

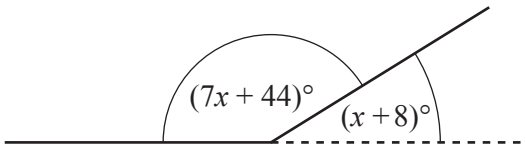
$h =$ ..... [3]

(b) Find the perimeter of this triangle.

..... cm [1]

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11



NOT TO SCALE

The diagram shows two sides of a regular polygon.
The interior angle of the polygon is $(7x + 44)°$ and the exterior angle is $(x + 8)°$.

Find the number of sides of this polygon.

..... [4]

12 Keita invests \$4000 at a rate of 2.6% per year compound interest.

Work out the interest earned on the investment at the end of 3 years.

\$ ..... [3]

13 Convert $0.2\dot{4}$ to a fraction.
You must show all your working and give your answer in its simplest form.

..... [2]

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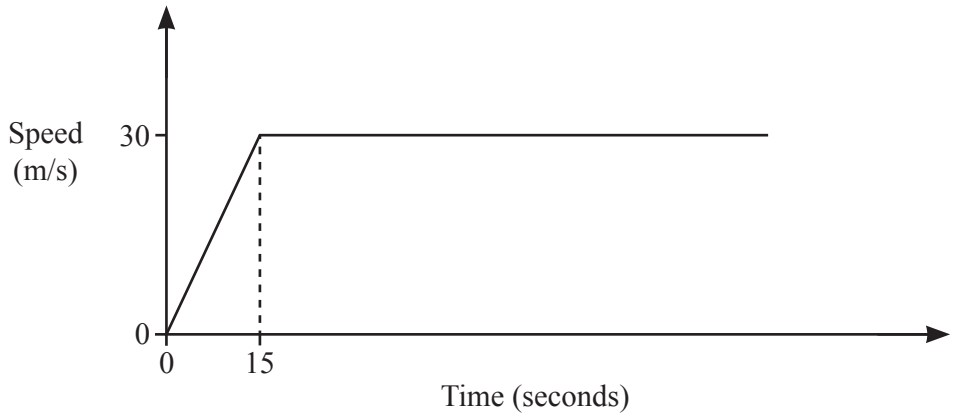
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14 A map has a scale of $1 : 200\,000$.

Find the area, in square kilometres, of a lake that has an area of $12.4\,cm^2$ on the map.

..... km^2 [2]

15 The diagram shows the speed–time graph for part of the journey of a car.



The car starts from rest and accelerates at a uniform rate for 15 seconds before reaching a constant speed of 30 m/s.

(a) Calculate the acceleration for the first 15 seconds.

..... m/s^2 [1]

(b) After T **minutes**, the total distance travelled is 45 **kilometres**.

Find the value of T.

$T =$ ..... min [4]

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[Turn over

16 A kite is drawn on a coordinate grid.
The diagonals of the kite intersect at the point $(-2, -5)$.

One diagonal has equation $y = 4x + 3$.

Find the equation of the other diagonal of the kite.
Give your answer in the form $y = mx + c$.

$y =$ ..... [3]

17 y is proportional to the square of $(x - 7)$.
When $x = 12$, $y = 2$.

Find y when $x = 17$.

$y =$ ..... [3]

18 Two bottles are mathematically similar.
The small bottle has a capacity of 324 ml and a height of 12 cm.
The large bottle has a capacity of 768 ml.

Calculate the height of the large bottle.

..... cm [3]

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19 $f(x) = 5x - 3,\ x > 1$

$g(x) = \frac{10}{x-2},\ x \neq 2$

(a) Find $gf(x)$.
Give your answer in its simplest form.

..... [2]

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

$g^{-1}(x) =$ ..... [3]

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

..... [1]

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[Turn over

20 (a)

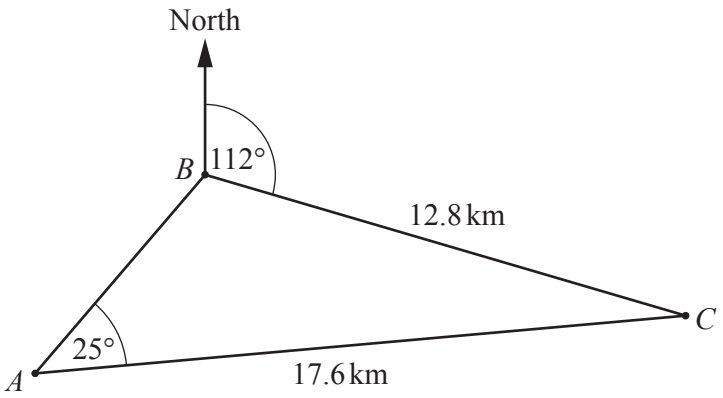


Sketch the graph of $y = \sin x$ for $0° \leqslant x \leqslant 360°$. [2]

(b) Solve $3 - 2\sin x = \frac{13}{4}$ for $0° \leqslant x \leqslant 360°$.

$x =$ ..... or $x =$ ..... [3]

21



NOT TO SCALE

The diagram shows the positions of three ships A, B and C.
$AC = 17.6$ km, $BC = 12.8$ km and angle $BAC = 25°$.
The bearing of C from B is 112° and angle ABC is obtuse.

Calculate the bearing of B from A.

..... [5]

Question 22 is printed on the next page.

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22 **(a)** Expand and simplify.

$$(2x-1)(x+4)(x-3)$$

..... [3]

(b) Write as a single fraction in its simplest form.

$$\frac{4}{2x-3} \div \frac{2x^2+14x}{2x^2+11x-21}$$

..... [4]

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