* 0000800000001 * DFD

Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

* 1 5 7 5 8 6 9 5 1 1 *

MATHEMATICS **0580/23**

Paper 2 Non-calculator (Extended) **May/June 2025**

2 hours

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.
- Calculators must **not** be used in this paper.
- You may use tracing paper.
- You must show all necessary working clearly.

INFORMATION

- The total mark for this paper is 100.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **16** pages.

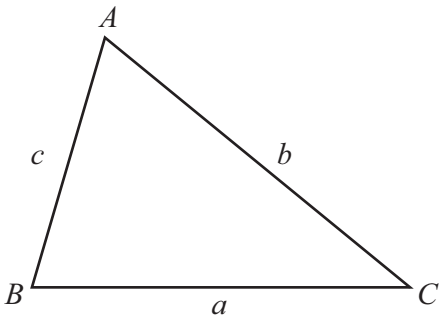
DC (DE/SG) 341842/3
© UCLES 2025

[Turn over

List of formulas

Area, A, of triangle, base b, height h.	$A = \frac{1}{2}bh$
Area, A, of circle of radius r.	$A = \pi r^2$
Circumference, C, of circle of radius r.	$C = 2\pi r$
Curved surface area, A, of cylinder of radius r, height h.	$A = 2\pi rh$
Curved surface area, A, of cone of radius r, sloping edge l.	$A = \pi rl$
Surface area, A, of sphere of radius r.	$A = 4\pi r^2$
Volume, V, of prism, cross-sectional area A, length l.	$V = Al$
Volume, V, of pyramid, base area A, height h.	$V = \frac{1}{3}Ah$
Volume, V, of cylinder of radius r, height h.	$V = \pi r^2 h$
Volume, V, of cone of radius r, height h.	$V = \frac{1}{3}\pi r^2 h$
Volume, V, of sphere of radius r.	$V = \frac{4}{3}\pi r^3$
For the equation $ax^2 + bx + c = 0$, where $a \neq 0$,	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

For the triangle shown,



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

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

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

DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN

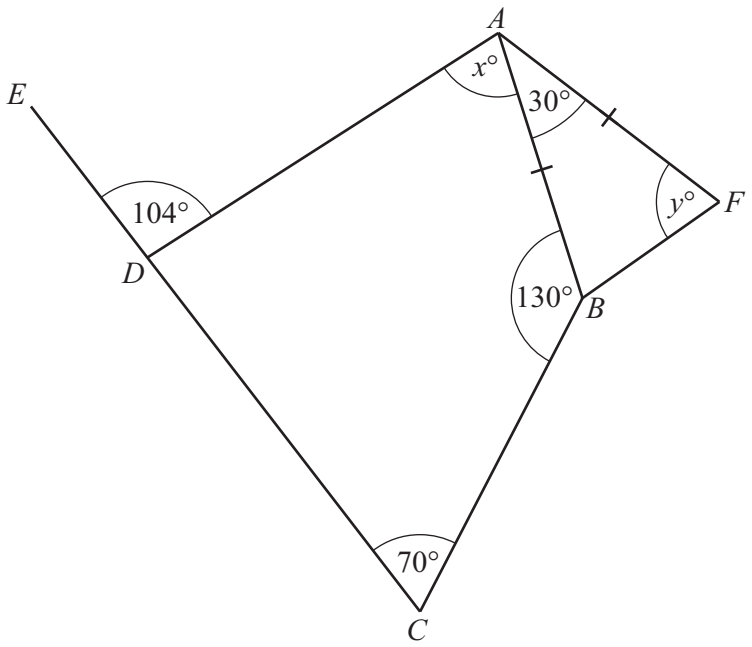
Calculators must **not** be used in this paper.

1 The probability of picking a green pen from a box is 0.17 .

Find the probability of not picking a green pen from the box.

..... [1]

2



NOT TO SCALE

ABCD is a quadrilateral.
CDE is a straight line.
AFB is an isosceles triangle.

Find the value of x and the value of y.

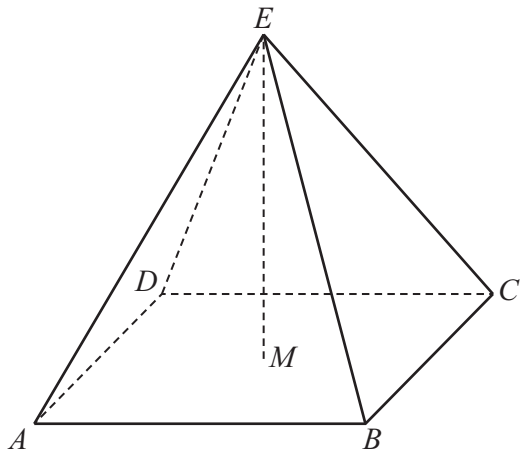
$x =$ .....

$y =$ .....

[4]

DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN

3



NOT TO SCALE

The diagram shows a pyramid *ABCDE* with a square base.
M is the centre of the square base.
E is vertically above *M*.

(a) Write down the number of planes of symmetry of this pyramid.

..... [1]

(b) Using two of the letters from *A*, *B*, *C*, *D*, *E* and *M*, complete the statement about the pyramid.

The axis of rotational symmetry passes through the points ..... and ..... [1]

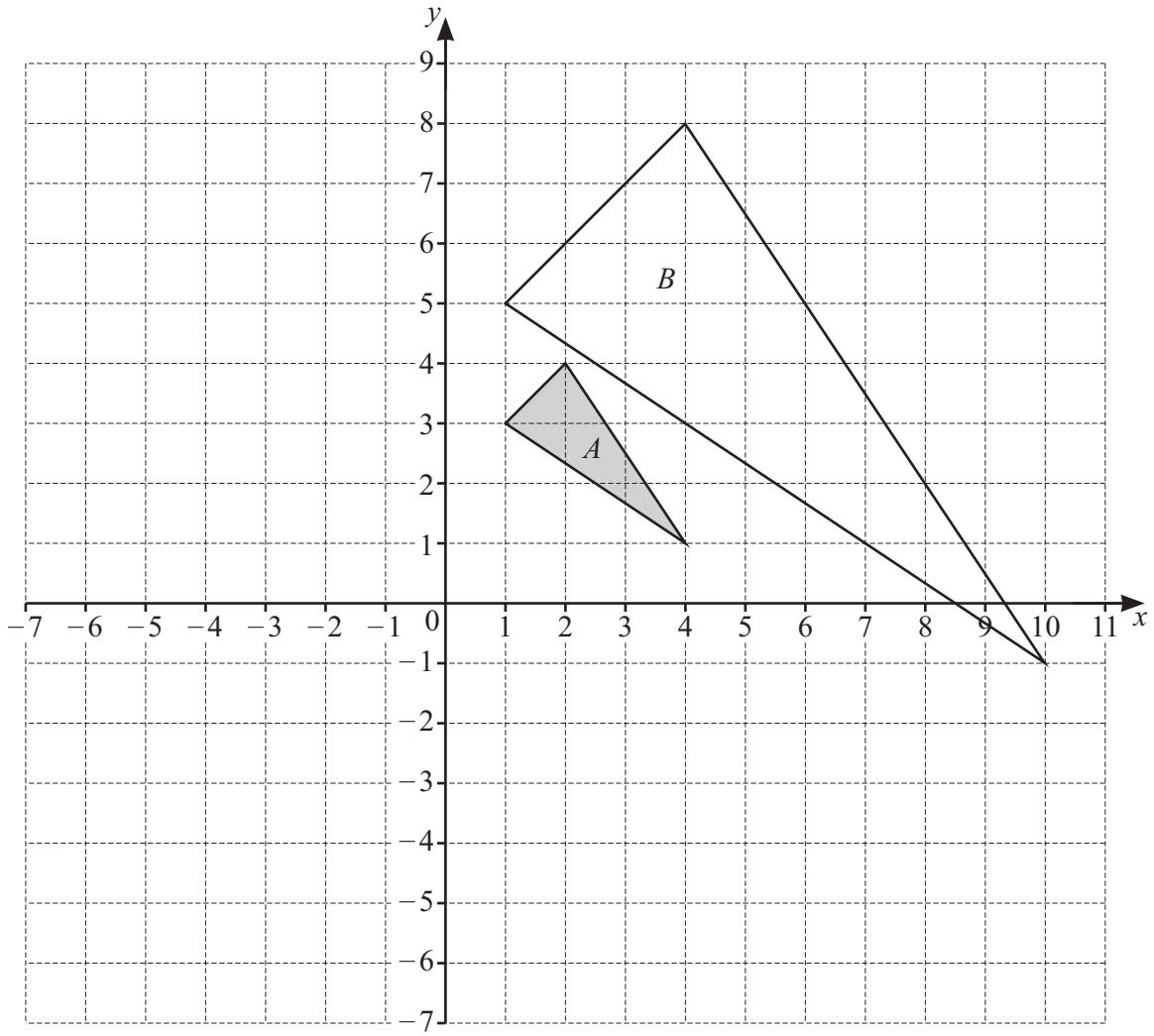
4 The number of ice creams sold increases as the temperature rises.

What type of correlation does this statement describe?

..... [1]

DO NOT WRITE IN THIS MARGIN

5



(a) Describe fully the **single** transformation that maps triangle A onto triangle B.

.....

..... [3]

(b) On the grid, draw the image of

(i) triangle A after a reflection in the line $x = -1$ [2]

(ii) triangle A after a rotation 90° clockwise, centre $(1, -2)$. [2]

DO NOT WRITE IN THIS MARGIN

6 There are 15 giraffes in a group.
The table gives information about the heights of the 15 giraffes.

One giraffe has a height of 2.6 m
No giraffe is shorter than 2.5 m
The range of heights for the 15 giraffes is 2.3 m
More than 3 giraffes have the same height
The modal height for the giraffes is 3.9 m

The stem-and-leaf diagram shows information about the height of 9 of these giraffes.

2	5
3	2 7 7
4	1 1 4 5 7

Key: 4|1 represents a giraffe height of 4.1 m

Use the information in the table to complete the stem-and-leaf diagram for the group of 15 giraffes.

[3]

DO NOT WRITE IN THIS MARGIN

7 Work out.

(a) $\frac{5}{6} - \frac{7}{12}$

Give your answer as a fraction in its simplest form.

..... [2]

(b) $1\frac{1}{3} \div \frac{8}{15}$

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

..... [3]

8 **(a)** Write 42 as a product of its prime factors.

..... [2]

(b) Find the highest common factor (HCF) of 84 and 70.

..... [2]

DO NOT WRITE IN THIS MARGIN

9 **(a)** Solve.

$$5x^2 = 12 - 17x$$

$x =$ ..... or $x =$ ..... [4]

(b) $ax^2 + a = b$ where a and b are integers.

One solution of this equation is $x = 6$.

Write down the other solution.

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

10 Solve the simultaneous equations.

$$4x - 5y = 13$$
$$3x - 2y = 8$$

$x =$ .....

$y =$ .....

[4]

DO NOT WRITE IN THIS MARGIN

11 Angela picks a number at random from the numbers 1, 2 and 3.
She then picks a number at random from the numbers 4, 5 and 6.
She adds the two numbers to find the total.

(a) Complete the table to show the possible outcomes.

		First number		
	+	1	2	3
Second number	4	5	6	7
	5			
	6			

[2]

(b) Given that the total is odd, find the probability that one of the numbers Angela picks is 3.

..... [2]

12 **(a)** $\mathbf{v} = \begin{pmatrix} 2 \\ -3 \end{pmatrix}$

Find $5\mathbf{v}$.

$\begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [1]

(b) H is the point $(-3, 8)$ and K is the point $(-4, 0)$.

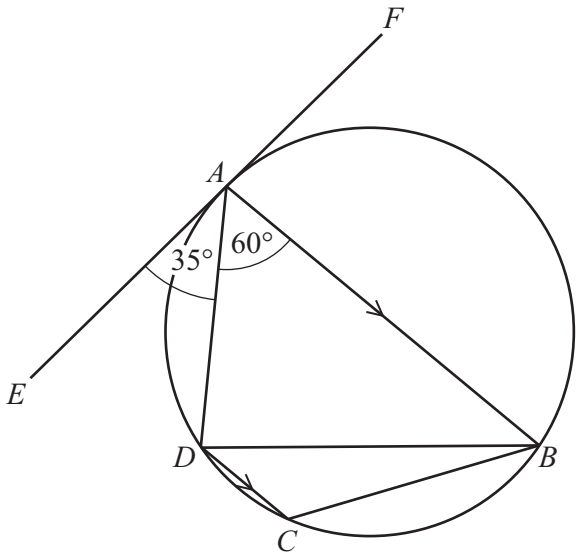
$\overrightarrow{HJ} = \begin{pmatrix} 7 \\ -2 \end{pmatrix}$

Find $\left|\overrightarrow{JK}\right|$.

..... [4]

DO NOT WRITE IN THIS MARGIN

13



NOT TO SCALE

A, B, C and D are points on a circle.
EF is a tangent to the circle at A.
AB is parallel to DC.

(a) Find angle DCB, giving a geometrical reason.

Angle DCB = ... because .....

..... [2]

(b) Find angle DBC.

Angle DBC = ... [2]

14 Find the lowest common multiple (LCM) of $15xy^3$ and $18x^4y$.

..... [2]

DO NOT WRITE IN THIS MARGIN

15 **(a)** Simplify.

$$\sqrt{27} + \sqrt{12}$$

..... [2]

(b) $\dfrac{40\sqrt{8}}{5\sqrt{2}} = k$, where k is an integer.

Find the value of k.

$k =$ ..... [2]

(c) Rationalise the denominator.

$$\frac{1}{3 - \sqrt{5}}$$

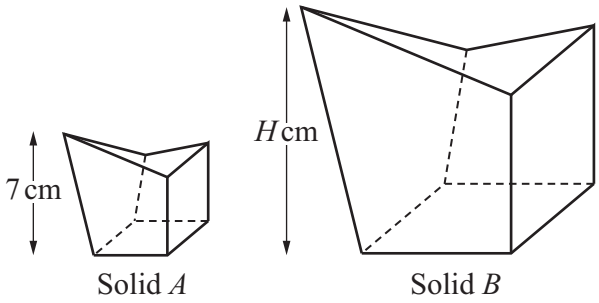
..... [2]

16 Write $0.3\dot{2}\dot{8}$ as a fraction in its simplest form.

..... [3]

DO NOT WRITE IN THIS MARGIN

17 Solid A is mathematically similar to solid B.



NOT TO SCALE

The height of solid A is 7 cm and its surface area is 60 cm^2.
The surface area of solid B is 540 cm^2.

Calculate the height of solid B.

..... cm [3]

18 Make t the subject of the formula.

$$2 = \frac{m(1-t)}{pt}$$

$t =$ ..... [4]

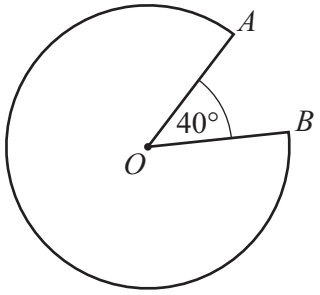
19 Simplify.

$$\frac{7x - x^2}{49 - x^2}$$

..... [3]

DO NOT WRITE IN THIS MARGIN DO NOT WRITE IN THIS MARGIN DO NOT WRITE IN THIS MARGIN DO NOT WRITE IN THIS MARGIN DO NOT WRITE IN THIS MARGIN

20



NOT TO SCALE

The diagram shows a sector of a circle, centre O.
The radius of the circle is 6 cm.

Calculate the length of the major arc AB.
Give your answer in its simplest form in terms of π.

.....cm [3]

21 **(a)** Differentiate $x^3 - 3x^2 + 1$.

..... [2]

(b) Find the coordinates of the turning points of the graph of $y = x^3 - 3x^2 + 1$.

(..... , ...)

(..... , ...)

[4]

DO NOT WRITE IN THIS MARGIN

22 $f(x) = 2x + 5$ $g(x) = x - 4$ $h(x) = 5^x$

(a) Find $f(3)$.

..... [1]

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

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

(c) Solve $fg(x) = 25$.

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

(d) Find x when $h^{-1}(x) = 2$.

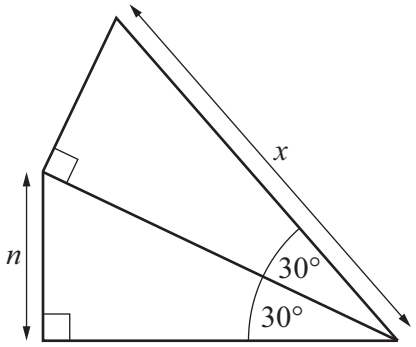
$x =$ ..... [2]

DO NOT WRITE IN THIS MARGIN

23 **(a)** Write down the value of cos 90°.

..... [1]

(b)



NOT TO SCALE

The diagram shows two different right-angled triangles joined by a common side.

Find x in terms of n.

$x =$ ..... [5]

Question 24 is on the next page.

DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN

24 **(a)** A is the point $(a, 12)$ and B is the point $(b, 27)$.

(i) Find the y-coordinate of the midpoint of AB.

..... [1]

(ii) The line AB has gradient 3.

Find an expression for a in terms of b.

$a =$ ..... [3]

(b) D is the point $(22, 34)$ and E is the point $(23, 39)$.
D is the point on CE such that $2CE = 5DE$.

Find the coordinates of C.

(..... , ...) [3]

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge Assessment International Education Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cambridgeinternational.org after the live examination series.

Cambridge Assessment International Education is part of Cambridge Assessment. Cambridge Assessment is the brand name of the University of Cambridge Local Examinations Syndicate (UCLES), which is a department of the University of Cambridge.

DO NOT WRITE IN THIS MARGIN DO NOT WRITE IN THIS MARGIN DO NOT WRITE IN THIS MARGIN DO NOT WRITE IN THIS MARGIN DO NOT WRITE IN THIS MARGIN