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MATHEMATICS**0580/42**

Paper 4 Calculator (Extended)

May/June 2026**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. Do **not** use correction fluid or tape.
- Do **not** write on any bar codes.
- You should use a scientific 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 100.
- The number of marks for each question or part question is shown in brackets [].

This document has **16** pages.

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 .

$$V = \frac{1}{3}\pi r^2 h$$

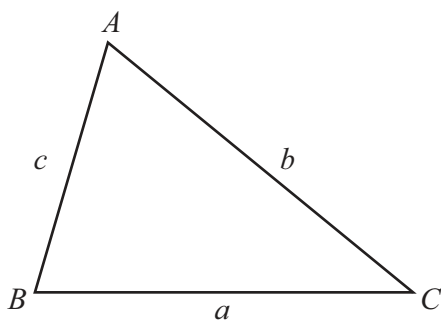
Volume, V , of sphere of radius r .

$$V = \frac{4}{3}\pi r^3$$

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,



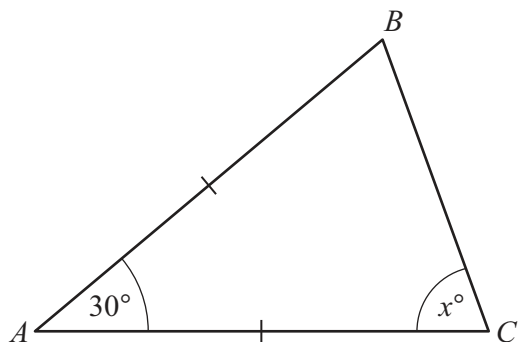
$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

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

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



1



NOT TO SCALE

Triangle ABC is isosceles with $AB = AC$.

Find the value of x .

$x = \dots\dots\dots$ [2]

- 2 A librarian records the number of books borrowed by each of 40 students.
The frequency table shows the results.

number of books	0	1	2	3	4	5
frequency	5	14	10	8	1	2

- (a) Find the mode.

$\dots\dots\dots$ [1]

- (b) Find the median.

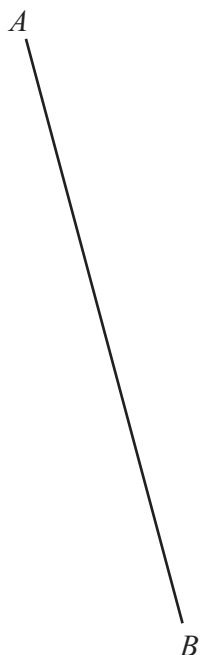
$\dots\dots\dots$ [1]

- (c) Calculate the mean.

$\dots\dots\dots$ [3]



3



In triangle ABC , $AC = 10$ cm and $BC = 8.5$ cm.

Using a ruler and compasses only, construct triangle ABC .
The line AB has been drawn for you.

[2]

- 4 A television costs \$1260.
Liesl pays a deposit of 35% of the cost of the television.
She then pays monthly payments of \$45.50 for the remaining cost of the television.
- Find the number of monthly payments that Liesl pays.

..... [3]

- 5 P is the point $(-3, 5)$ and $\overrightarrow{PQ}$ is $\begin{pmatrix} 8 \\ -3 \end{pmatrix}$.

Find the coordinates of the point Q .

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



- 6 A semicircle has a diameter of 15.8 cm.

Calculate the perimeter of the semicircle.

..... cm [3]

- 7 (a) Tom invests \$2500 at a rate of 4.4% per year compound interest.

Calculate the value of the investment at the end of 6 years.

\$ [2]

- (b) Behnaz invests \$4500 at a rate of $r\%$ per year compound interest.
At the end of 5 years, the value of the investment is \$5420.

Calculate the value of r .

$r =$ [3]



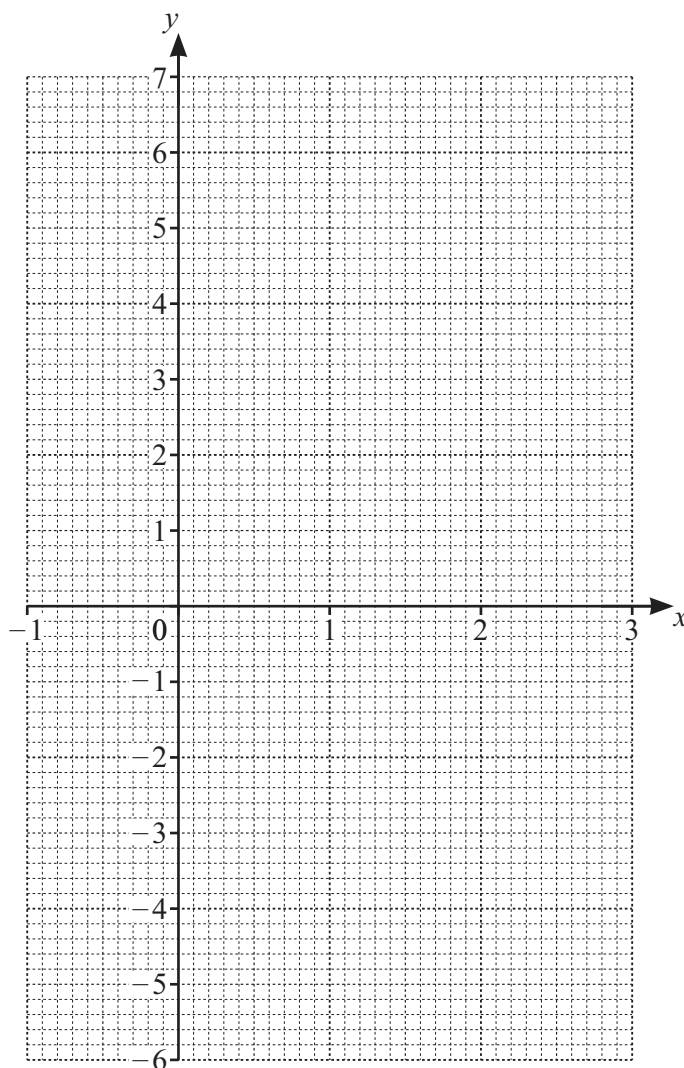
- 8 The table shows some values, correct to 1 decimal place, for $y = x^3 - 2x^2 - 2$.

x	-1	-0.5	0	0.5	1	1.5	2	2.5	3
y		-2.6	-2	-2.4		-3.1	-2		7

- (a) Complete the table.

[3]

- (b) On the grid, draw the graph of $y = x^3 - 2x^2 - 2$ for $-1 \leq x \leq 3$.



[4]



(c) By drawing a suitable straight line, solve the equation $x^3 - 2x^2 - x + 1 = 0$.

$$x = \dots\dots\dots \text{ or } x = \dots\dots\dots \text{ or } x = \dots\dots\dots [4]$$

9 Solve the equation.

$$\frac{w+8}{4} = \frac{2w-3}{3}$$

$$w = \dots\dots\dots [3]$$

10 Yasmin collects coins.

10% of her coins are gold.

25% of the **remaining** coins are silver.

The other 54 coins are copper.

(a) Calculate the number of silver coins.

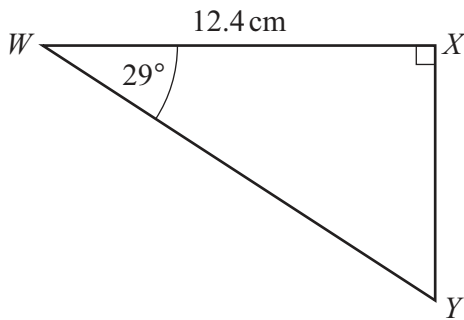
$$\dots\dots\dots [2]$$

(b) Calculate the total number of coins.

$$\dots\dots\dots [2]$$



11



NOT TO SCALE

Calculate XY .

..... cm [2]

- 12 A scientist records the mass of a radioactive substance at the same time each day. On 10 January, the scientist records a mass of 150 grams. Each day, the mass of the substance decreases by 5%.

Find the date on which the scientist first records a mass of less than 96 grams.

..... [3]



- 13 y is inversely proportional to x .
When $x = 6$, $y = 10.5$.

Find y when $x = 9$.

$y = \dots\dots\dots$ [3]

- 14 $\cos x = 0.41$

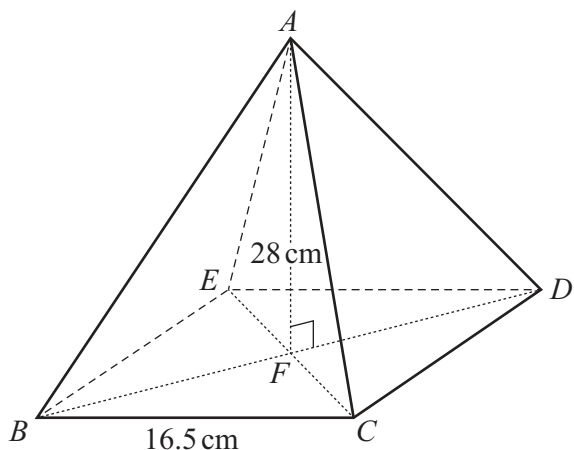
Find the reflex angle x .

$x = \dots\dots\dots$ [2]

- 15 Write $\frac{8}{x+2} + \frac{3}{x-4}$ as a single fraction in its simplest form.

$\dots\dots\dots$ [3]





NOT TO SCALE

$ABCDE$ is a square-based pyramid.
 EC and BD intersect at F .
 AF is perpendicular to the base $BCDE$.

$BC = 16.5$ cm and $AF = 28$ cm.

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

..... [1]

- (b) Calculate the volume of the pyramid.

..... cm^3 [2]

- (c) Calculate AB .

..... cm [4]



(d) Calculate the angle between AB and the base $BCDE$.

..... [2]

17 $f(x) = 20 - 3x$ $g(x) = \frac{64}{2^x}$ $h(x) = 7 + 2x$

(a) Find $f(4)$.

..... [1]

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

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

(c) Find $gg(5)$.

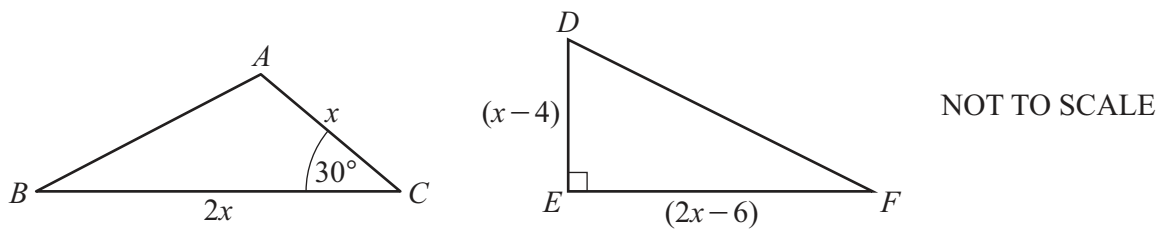
..... [2]

(d) Solve the equation $g^{-1}(x) = 8$.

$x =$ [2]



18 In this question, all lengths are in centimetres.



(a) Show that the area of triangle ABC is $\frac{1}{2}x^2 \text{ cm}^2$.

[1]

(b) The area of triangle ABC is equal to the area of triangle DEF .

Show that $x^2 - 14x + 24 = 0$.

[3]

(c) By factorising and solving $x^2 - 14x + 24 = 0$, find the area of triangle ABC .

..... cm^2 [4]



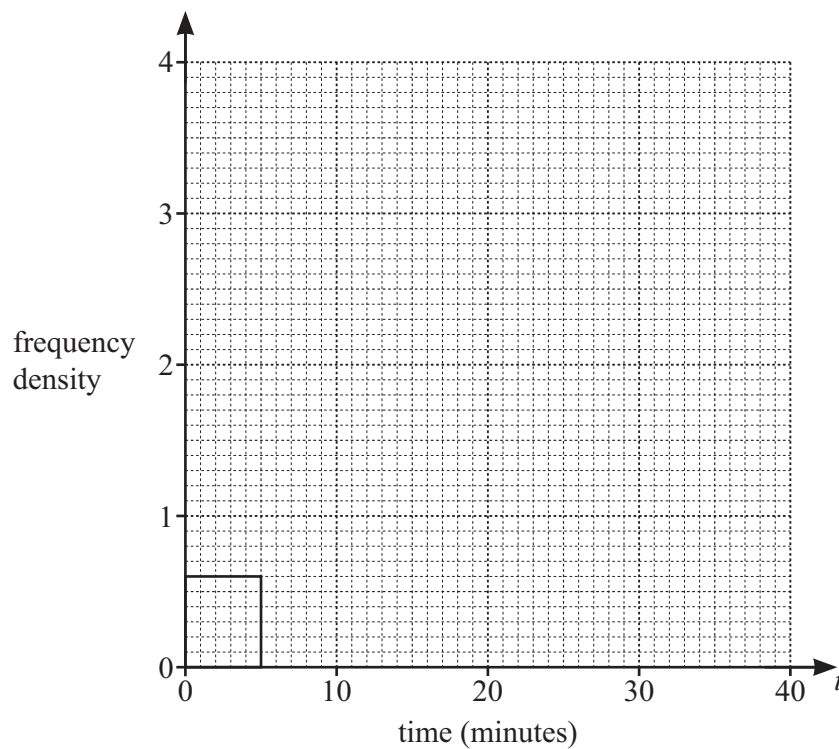
- 19 The time spent in a shop by each of 40 customers is recorded. The table shows the results.

time (t minutes)	$0 < t \leq 5$	$5 < t \leq 10$	$10 < t \leq 20$	$20 < t \leq 40$
frequency	3	18	13	6

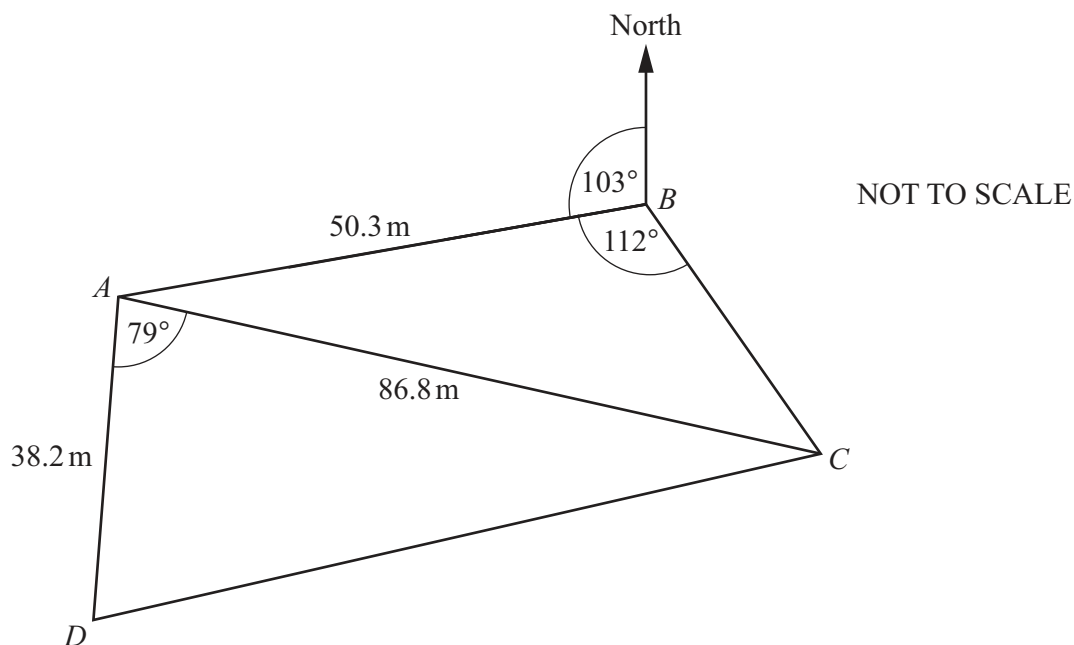
- (a) Calculate an estimate of the mean time.

..... minutes [4]

- (b) Complete the histogram to show the information in the frequency table.



[3]



The diagram shows a field $ABCD$ with a straight footpath from A to C .

(a) Find the bearing of A from B .

..... [1]

(b) Calculate the distance CD .

..... m [3]





(c) Calculate the shortest distance from B to AC .

..... m [6]

- 21 The volume of a solid metal cuboid is 22 cm^3 , correct to the nearest cm^3 .
The mass of the metal cuboid is 140 grams, correct to the nearest 10 grams.

Calculate the lower bound of the density of the metal.
[Density = mass $\div$ volume]

..... g/cm^3 [3]

Question 22 is on the back page.





- 22 Write $\frac{8x^2 + 24x}{2x^2 - 18}$ as a single fraction in its simplest form.

..... [3]

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