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MATHEMATICS	0580/02
Paper 2 Non-Calculator (Extended)	2025
PRACTICE PAPER 1	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 in the space 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 17 pages. Any blank pages are indicated.

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 .	$A = \pi r l$
	Surface area, A , of sphere of radius r .	$A = 4\pi r^2$
rl	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,



$\frac{a}{\sin A} =$	$=\frac{b}{\sin B}=$	$=\frac{c}{\sin C}$
$a^2 = b^2$	$c^{2}+c^{2}-c^{2}$	$2bc\cos A$
Area =	$\frac{1}{2}ab\sin \theta$	С

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

1 Write down the value of $\sqrt{196}$.

.....[1]

2 Find the highest common factor of 54 and 72.

-[2]
- 3 Complete this statement with one of $=, >, <, \leq$ or \geq .
 - $2\frac{2}{3}$ 2.67 [1]
- 4 By writing each numbers correct to 1 significant figures, estimate the value of

$$\frac{12.75 \times 58.3}{\sqrt[3]{967}}$$

.....[2]

5 Simplify.

 $\sqrt{75} - \sqrt{12}$

.....[2]

6 Find the value of

 $3^{-2} \times 81^{\frac{1}{2}}$

......[2]

7 $\mathbf{u} = \begin{pmatrix} r lr l & -4 \\ q \end{pmatrix}$ $|\mathbf{u}| = 8$ Calculate the value of q. Express your answer in the form $a\sqrt{b}$.

- 8 Consuela allocates her weekly income to rent, beauty and food in a ratio of 3:5:2. Consuela's income in 2025 is \$1200 per week.
 - (a) Calculate the the amount Consuela spends on beauty in a fortnight.

(b) Consuela's weekly income in in 2025 is a 25% increase on 2025. Find Consuela's weekly income in 2025.

9 Expand and simplify.

$$x(x-5)(x+3)$$

......[3]

10 y is inversely proportional to the square root of (x-4). When x = 20, y = 3. Find the value of y when x = 29



11 The diagram below shows the graph of line
$$l_1$$
.

(a) On the grid, draw the line $y = \frac{1}{4}x - 6$.

[2]

(**b**) Find the equation of line l_1 .

[Turn over

- 6
- 12 Represent the inequality $-4 < x \le 3$ on the numberline.

$$-5 -4 -3 -2 -1 0 1 2 3 4 5$$
 [2]

13 In triangle ABC, AC = 11 cm and BC = 9 cm. Using a ruler and compass only, draw the triangle ABC. The line AB has been drawn for you.

14 Simplify.

[2]

.....

$$5x^8 \times 3x^{-\frac{5}{2}}$$

-1 -2 3 20

The rule for the *n*th term of this sequence is $n^3 + an^2 + bn$. Calculate the values of *a* and *b*.

 $a = \dots$ [5]

16 Find the equation of the perpendicular bisector of (2, -7) and (-4, -5).

.....[5]



- (a) On the diagram above, sketch the graph of $y = \cos x$ for $0^{\circ} \le x \le 360^{\circ}$.
- (b) Solve the equation $2\cos x 1 = 0$ for $0^\circ \le x \le 360^\circ$.

 $x = \dots^{\circ} \text{ and } x = \dots^{\circ}$ [3]

[2]



17



Find the value of x° .

x =° [3]



..... m³ [2]

21 In this question all measurements are in metres.



The height of the trapezium if x and the lengths of the parallel sides are x and 2x + 1 respectively. The area of the trapezium is 0.125 m².

(a) Show that $12x^2 + 4x - 1 = 0$.

(b) Factorise $12x^2 + 4x - 1$.

.....[2]

[4]

(c) Solve $12x^2 + 4x - 1 = 0$ and hence find the height of the trapezium.

height =[2]

22 Sketch the graph of $y = \frac{1}{2}(2^x) + 1$. Clearly show the location of any intercepts or asymptotes.



23 The diagram shows a scatter plot of Mathematics marks and Rizz for a group of 20 students.



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12

A solid plastic cone has a base radius 5 cm and a slant length of 13 cm.

(a) The surface area of cone is $k\pi$. Work out the value of k.

(b) (i) Show that the height, h, of the cone is 12 cm.

[1]

(ii) Hence calculate, in terms of π , the volume of the cone.

 25 Students at Bongo Secondary School may study English (E) or Swahili (S). The Venn diagram shows information about the numbers of students studying each languages at the school.



(a) Find the probability that a student does not study English.

(b) Two students are chosen at random from the students who study English. Find the probability that both students also study Spanish.

......[3]



B, D, E and F lie on circle centre O. ABC is a tangent to the circle at B. Angle BED = 24° , angle ABF = 56° .

(a) Find the angle BFE.

26

(**b**) Find the angle BOD.

Angle BOD = [1]

(c) Find the angle OBD

Angle OBD = [1]

28



The two cylinders are mathematically similar.

The volume of the larger cylinder is 250 cm^3 and the volume of the smaller cylinder is 54 cm^3 . The height of the larger cylinder is 15 cm and the height of the smaller cylinder is *x* cm. Find the value of *x*.



A, B, C, and D lie on a circle. Calculate the value of *p*.

$$p = \dots ^{\circ}$$
 [3]

A normal, six-sided die is rolled 40 times.The results are shown in the frequency table below.

1	Score	1	2	3	4	5	6
11	Frequency	4	4	11	8	5	8

(a) Write down the modal score.

.....

[1]

- (b) Find the median score.
- (c) Calculate the mean score.

.....[2]

.....

Stanford is flying from Auckland to Singapore.
Stanford's flight leaves Auckland at 16:40 local time on Friday.
The flight time is 10 hours 45 minutes.
The timezone in Singapore is 4 hours behind Auckland.
At what time (local time in Singapore) does Stanford's flight land?

[2]

31
$$y = \frac{1}{3}x^3 - 2x^2 - 12x$$

(a) Find an expression for $\frac{dy}{dx}$.

 $\frac{\mathrm{d}y}{\mathrm{d}x} = \qquad [2]$

(b) Find the *x*-coordinates of the points on the curve where the gradient is equal to 9.

 $x = \dots$ [4]

32 At the end of high school, Chad has dated 24 of the girls in his year group. Chad has dated $\frac{3}{5}$ of the girls in his year group. Work out how many girls are in Chad's year group.

..... girls [2]