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MATHEMATICS**0580/41**

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 **20** 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 .

$$A = \pi rl$$

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 .

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

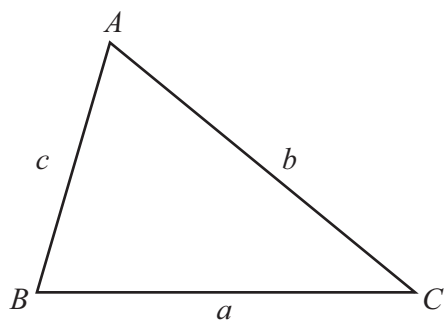
Volume, V , of sphere of radius r .

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

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 Simplify.

$$4x + 3y + 2x - 10y$$

..... [2]

2 Calculate.

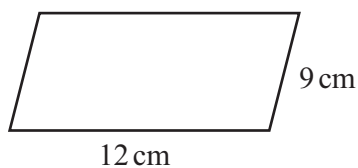
(a) $\frac{1}{0.025^2}$

..... [1]

(b) $\sqrt[4]{410 + 4^{-2}}$

..... [1]

3



NOT TO SCALE

The diagram shows a parallelogram.

Find the perimeter of the parallelogram.

..... cm [1]



- 4 Ben changes 150 pounds (£) into dollars (\$).
The exchange rate is £1 = \$1.32.

Calculate the number of dollars Ben receives.

\$..... [1]

5

$\frac{1}{11}$	1	$\sqrt{41}$	51	61	$\sqrt{81}$	91
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Complete each of these statements with a number from the list.

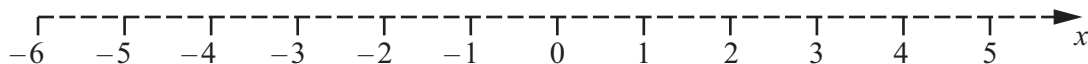
The cube number is

The prime number is

The irrational number is

[3]

- 6 Represent the inequality $-3 \leq x < 2$ on the number line.



[2]

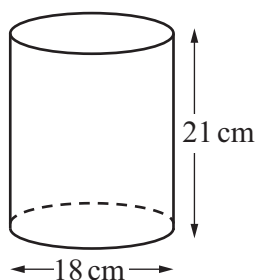


- 7 The original value of a car is \$23 000.
The value of the car decreases by 35% of its original value.

Calculate the value of the car after the decrease.

\$..... [2]

8



NOT TO SCALE

The diagram shows a cylinder with diameter 18 cm and height 21 cm.

- (a) Calculate the volume of the cylinder.

..... cm^3 [2]

- (b) Find the capacity of the cylinder in litres.

..... litres [1]

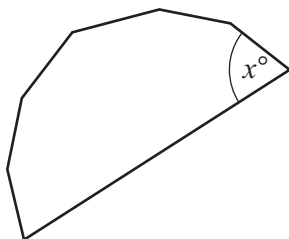


9 Factorise.

$$21y^2 - 7y$$

..... [2]

10



NOT TO SCALE

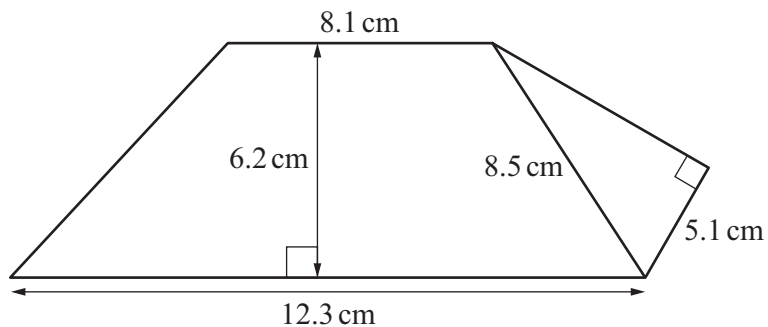
A regular polygon has 12 sides.
The diagram shows half of this regular polygon.

Find the value of x .

$x =$ [3]



- 11 The diagram shows a pentagon made by joining a trapezium to a right-angled triangle.



NOT TO SCALE

Calculate the area of the pentagon.

..... cm^2 [4]



12 (a) These are four values.

200 51 $2n$ $n + 1$

The mean of the four values is $3n$.

Find the value of n .

$n =$ [3]

(b) The table shows some information about the mass of each of 200 boxes.

mass (m grams)	$0 < m \leq 20$	$20 < m \leq 40$	$40 < m \leq 60$	$60 < m \leq 80$
frequency	29	67	55	49

Calculate an estimate of the mean.

..... g [4]

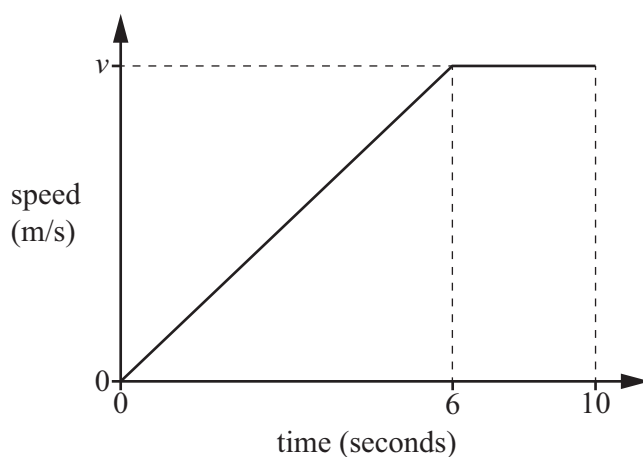


13 Factorise.

$$3x + 9y + 5px + 15py$$

..... [2]

14 The speed–time graph shows information about the first 10 seconds of a car journey.



NOT TO SCALE

The car accelerates at a constant rate before travelling at a constant speed.
The car travels a total distance of 119 metres.

Work out the value of v .

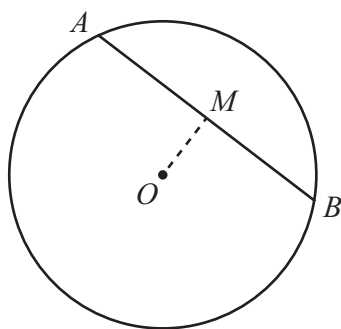
$v =$ [3]

15 Solve the inequality.

$$7x - 2 \leq 3(x + 2)$$

..... [3]

16



NOT TO SCALE

The diagram shows a circle, centre O .
 AB is a chord of length 14 cm.
 M is the midpoint of AB and $OM = 6$ cm.

Calculate angle OAM .

angle $OAM =$ [2]



- 17 (a) Sachin invests \$7200 at a rate of 3% per year simple interest.

Find the total value of the investment at the end of 5 years.

\$..... [3]

- (b) The mass of a large packet of rice is 30% greater than the mass of a small packet of rice.
The mass of the large packet of rice is 650 g.

Calculate the mass of the small packet of rice.

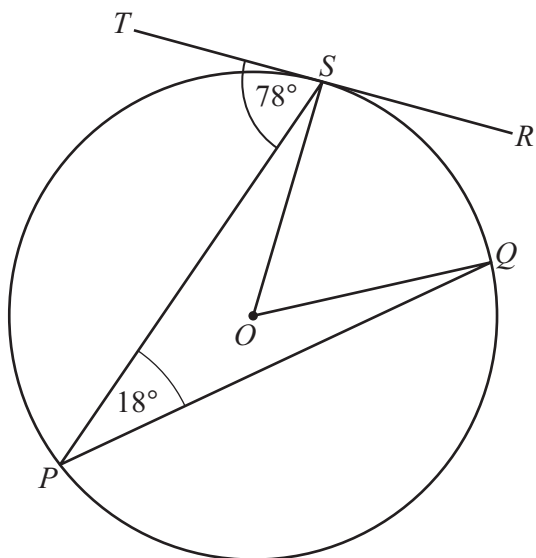
..... g [2]

- (c) In an experiment, Jenny starts with 4000 bacteria.
The number of bacteria is increasing exponentially at a rate of $r\%$ per day.
At the end of 6 days, the number of bacteria is 4598.

Find the value of r .

$r =$ [3]





NOT TO SCALE

P , Q and S are points on a circle, centre O .
 RT is a tangent to the circle at S .

Find the ratio angle PSO : angle PQO .
 Give your answer in its simplest form.

angle PSO : angle PQO = : [4]



- 19 (a) A bag contains some coloured counters.
The probability of picking a red counter from the bag is 0.24 .

(i) Find the probability of not picking a red counter from the bag.

..... [1]

- (ii) Sunil picks a counter at random from the bag and then replaces it.
He then picks a second counter at random from the bag.

Work out the probability that only one of the counters is red.

..... [2]

- (b) A box contains 50 pens.
There are n blue pens in the box.

Ahmed picks two of the pens from the box at random without replacement.

The probability that both pens are blue is $\frac{3}{35}$.

Find the value of n .

$n =$ [3]



20 (a) $f(x) = x^2 - 1$ $g(x) = 10 - 3x$

(i) Find $f(7)$.

..... [1]

(ii) Find the positive solution of $fg(x) = 120$.

$x =$ [4]

(b) $h(x) = 2x - 3$

The domain of $h(x)$ is $\{-5, 0, 2\}$.

Find the range of $h(x)$.

{ } [2]

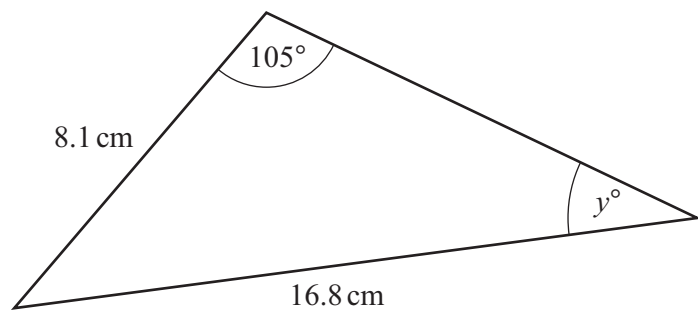
(c) $j(x) = 2^{3x}$

Solve the equation $j^{-1}(x) = 4$.

$x =$ [2]



21



NOT TO SCALE

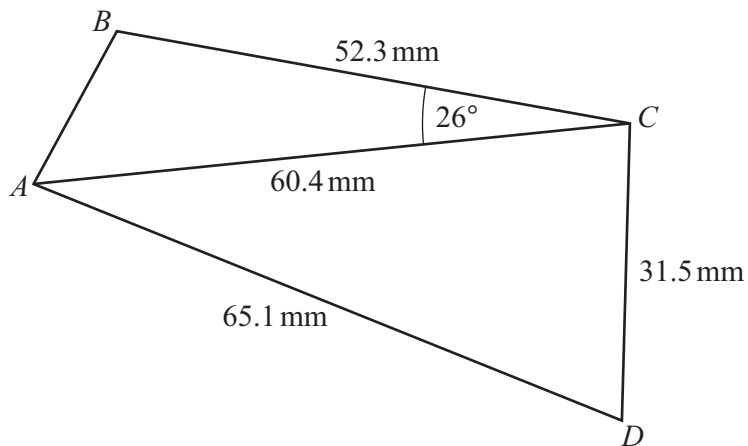
Calculate the value of y .

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

22 Rearrange the formula to make m the subject.

$$5m = x(7 + m)$$

$m = \dots\dots\dots$ [3]



NOT TO SCALE

The diagram shows two triangles, ABC and ACD .

(a) Calculate the area of triangle ABC .

..... mm^2 [2]

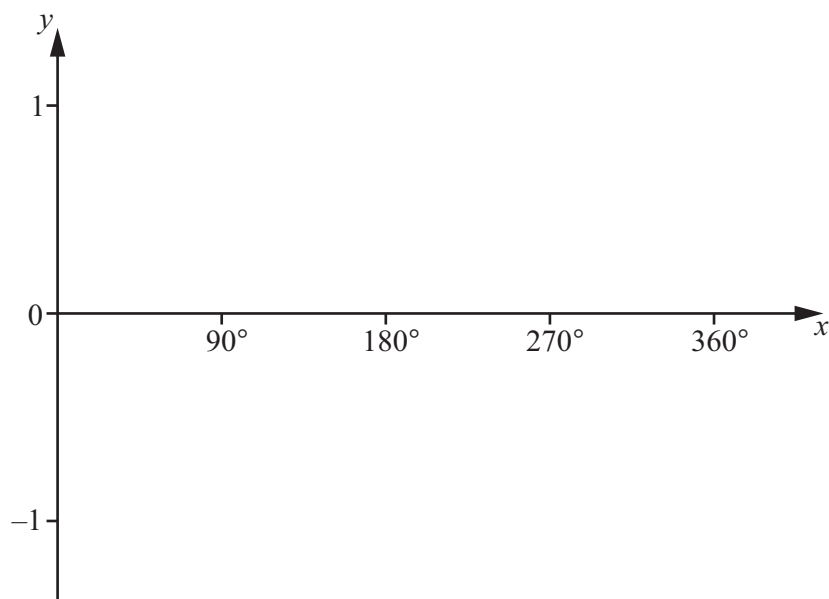
(b) Calculate angle ACD .

angle $ACD =$ [3]





24 (a) Sketch the graph of $y = \sin x$ for $0^\circ \leq x \leq 360^\circ$.



[2]

(b) Solve the equation $5 \sin x + 7 = 3$ for $0^\circ \leq x \leq 360^\circ$.

$x = \dots\dots\dots$ or $x = \dots\dots\dots$ [3]





25 $x^{-\frac{1}{3}} = 16x^{-1}$

Find the positive value of x .

$x = \dots\dots\dots$ [3]

26 Simplify.

$$(6x - 30) \times \frac{x^2 + 7x + 10}{3x^2 - 75}$$

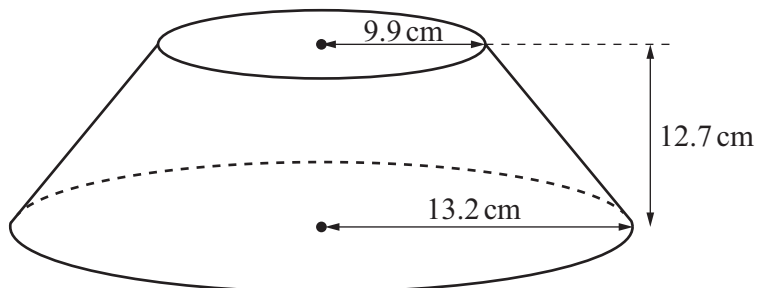
$\dots\dots\dots$ [4]

27 Beth runs 28 km, correct to the nearest kilometre.
Her average speed is 10 km/h, correct to the nearest 1 km/h.

Work out the upper bound of the time taken for Beth's run.

$\dots\dots\dots$ hours [3]





NOT TO SCALE

The diagram shows a frustum with height 12.7 cm.

Calculate the volume of the frustum.

..... cm³ [5]





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