Cambridge Assessment International Education

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MATHEMATICS **0580/42**

Paper 4 Calculator (Extended) **October/November 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.
- 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. Any blank pages are indicated.

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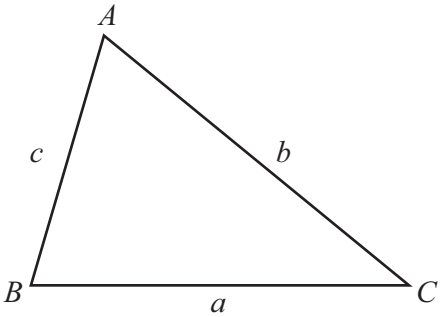
List of formulas

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 Write the ratio 60 grams : 3 kilograms in the form $1 : n$.

View solution

1 : ..... [2]

2 Solve.

View solution

$8x - 17 = 27$

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

3 Write down the order of rotational symmetry of a regular decagon.

View solution

..... [1]

4 Pedro makes cards.

(a) He makes cards at a rate of 9 cards every 20 minutes.

View solution

Work out the number of cards he makes in 8 hours.

..... [2]

(b) Each card costs 12 cents to make.
Pedro sells each card for 50 cents.

View solution

Work out his percentage profit on each card.

.....% [2]

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5 Nuwa is buying a phone.
One website sells the phone for 953 Yuan.
A different website sells the same phone for $141.
The exchange rate is 1 Yuan = $0.152 .

View solution

Calculate the difference between these phone prices.
Give your answer in dollars, correct to the nearest cent.

$ ..... [2]

6 One morning, a dentist has appointments for 10 patients.
The stem-and-leaf diagram shows the waiting time for 8 of these patients.

View solution

0	1 4
1	0 2 9
2	1 5 5

Key: 1 | 0 represents 10 minutes

The times for the two other patients, *P* and *Q*, are not shown in the stem-and-leaf diagram.

The mean waiting time of all 10 patients that morning is 16 minutes.
The range of waiting times is 26 minutes.
Patient *P* waits longer than patient *Q*.

Find the waiting time for each of patient *P* and patient *Q*.

Patient *P* .....min

Patient *Q* .....min

[4]

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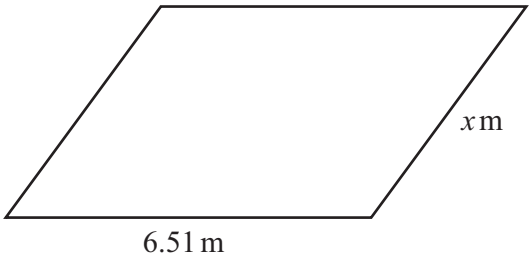
7 The diagram shows a parallelogram.



NOT TO SCALE

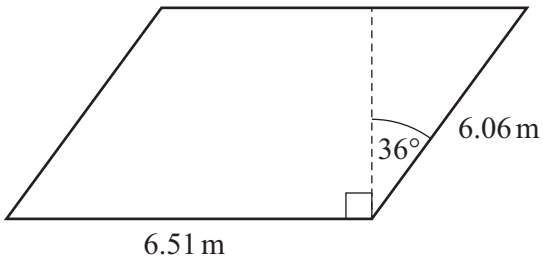
The parallelogram has the same perimeter as a circle with radius 4 m.

(a) Show that $x = 6.06$ m, correct to 2 decimal places.

View solution

[4]

(b)



NOT TO SCALE

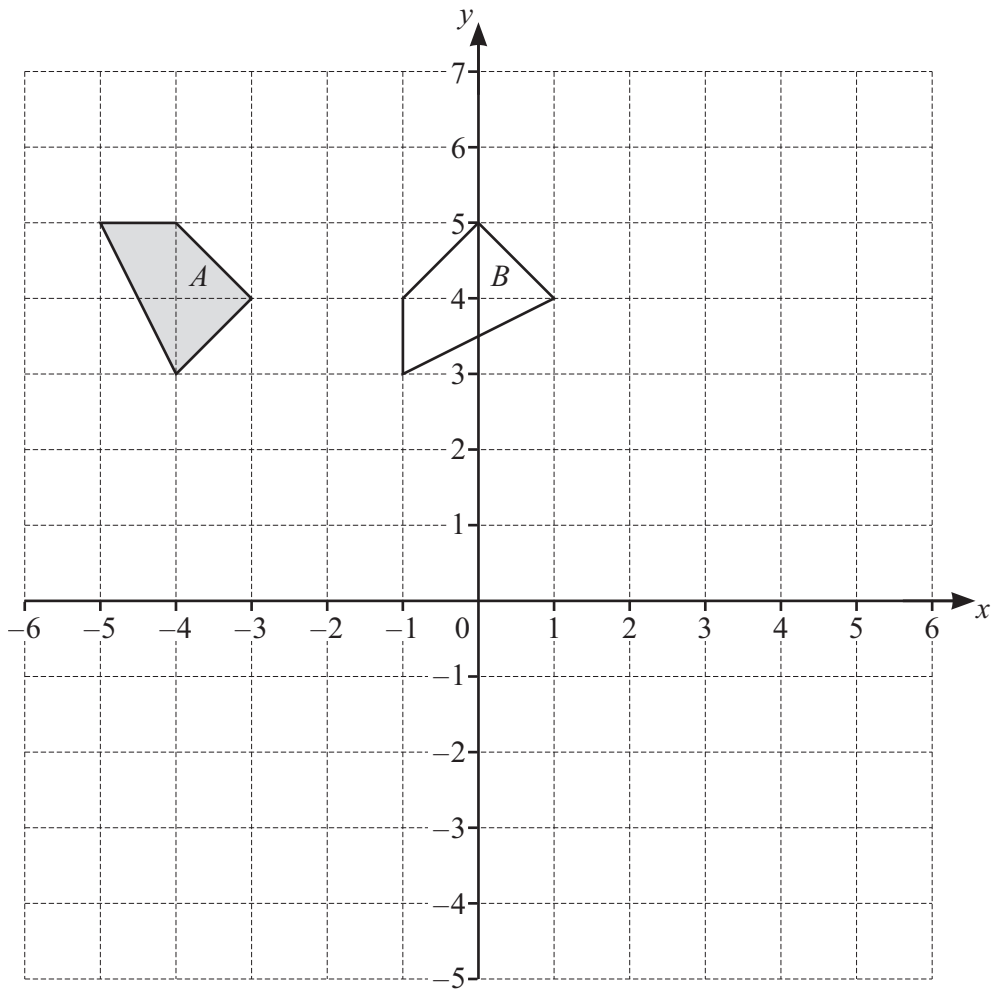
View solution

The floor of a room is in the shape of this parallelogram.
It costs \$18 per square metre to tile the floor.

Calculate the total cost of tiling the floor.

\$ ..... [4]

8



View solution

(a) On the diagram, draw the image of

(i) shape A after a translation by the vector $\begin{pmatrix} 1 \\ -7 \end{pmatrix}$ [2]

(ii) shape A after a reflection in the line $y = x + 1$. [3]

View solution

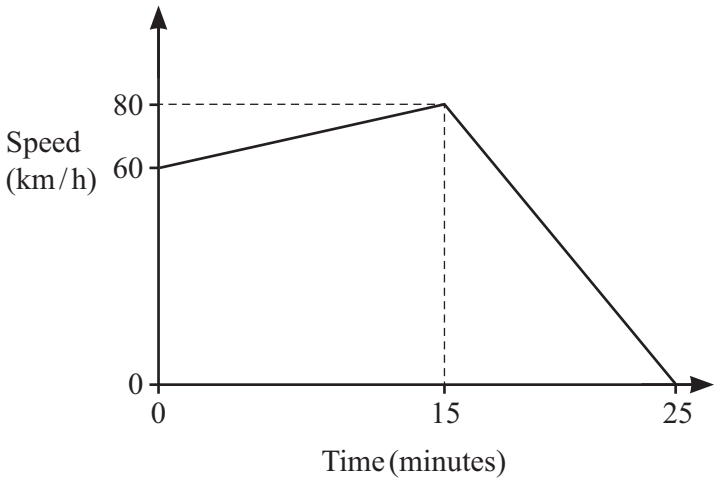
(b) Describe fully the **single** transformation that maps shape A onto shape B.

.....

..... [3]

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

View solution



NOT TO SCALE

Find the total distance travelled in the 25 minutes.

..... km [3]

10 Find the *n*th term of each sequence.

(a) 17, 9, 1, – 7, −15, …

View solution

..... [2]

(b) 3, 12, 27, 48, 75, …

View solution

..... [2]

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11 The table shows some values for $y = x^3 - 2x + 3$.
Where appropriate, values of y are given correct to 2 decimal places.

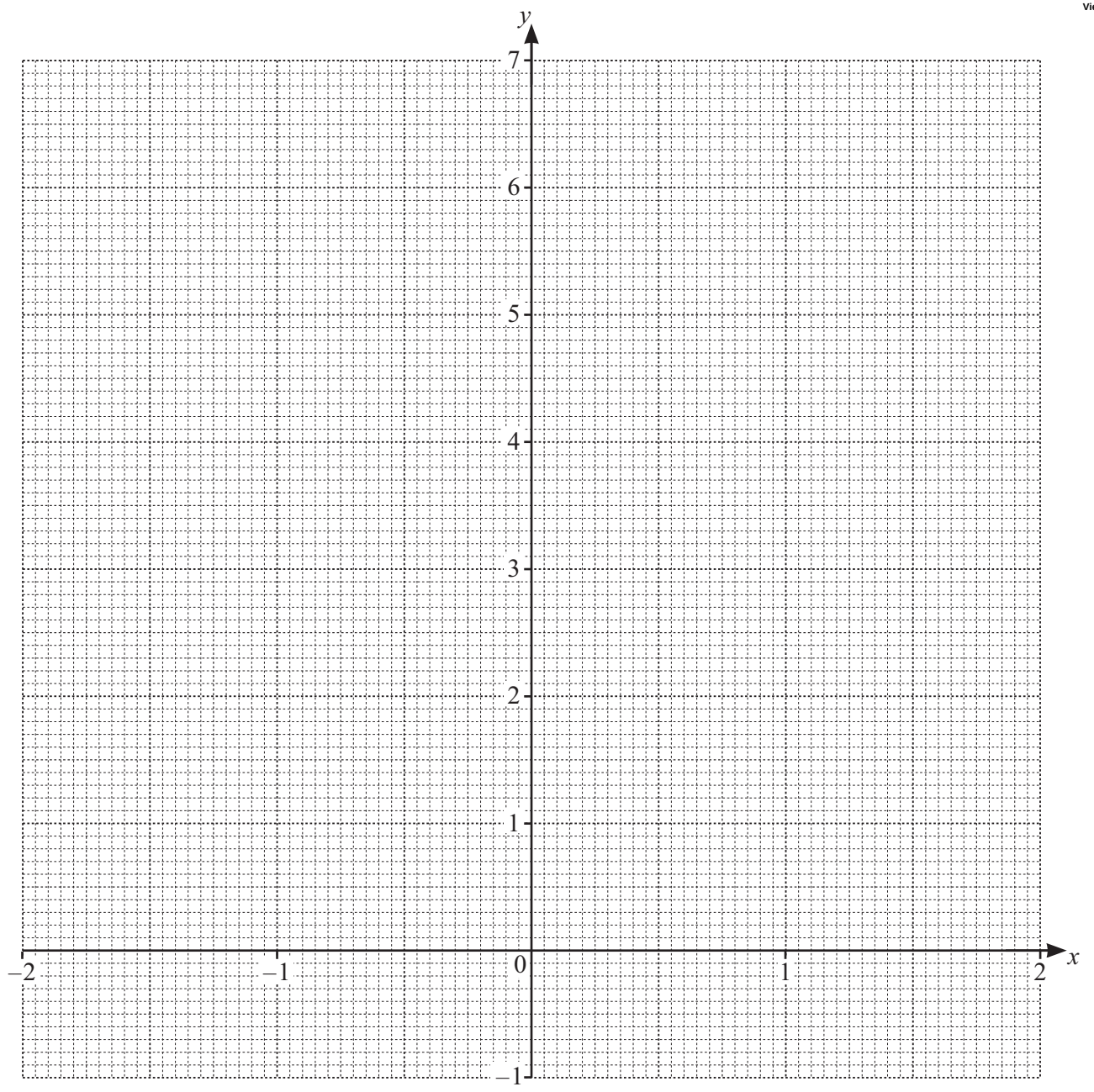
x	-2	-1.5	-1	-0.5	0	0.5	1	1.5	2
y	-1		4	3.88	3	2.13	2		7

View solution

(a) Complete the table. [2]

View solution

(b) Draw the graph of $y = x^3 - 2x + 3$ for $-2 \leqslant x \leqslant 2$.



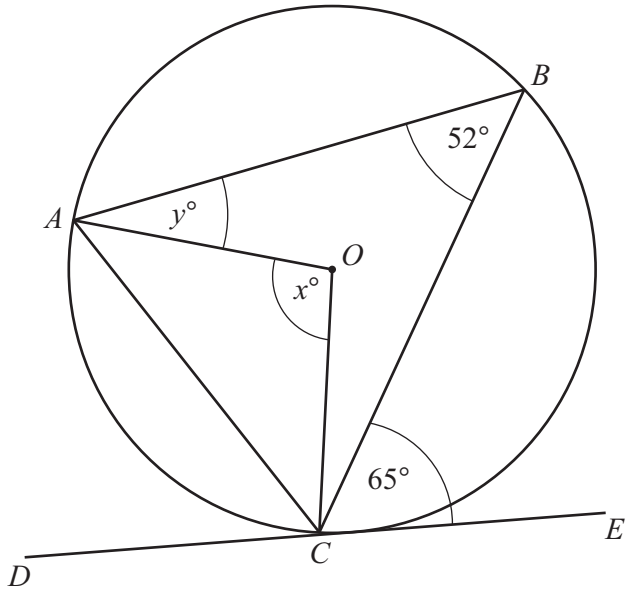
[4]

(c) By drawing a suitable straight line on the grid, solve the equation $x^3 - 2.5x + 1 = 0$.

View solution

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

12



NOT TO SCALE

A, B and C lie on a circle centre O.
DE is a tangent to the circle at C.
Angle $ABC = 52°$ and angle $BCE = 65°$.

(a) Find the value of x.
Give a geometrical reason for your answer.

View solution

$x =$ ..... because .....

..... [2]

(b) Find the value of y.

View solution

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

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13 Simplify.

$$\frac{7}{2m} + \frac{3}{8m}$$

View solution

..... [2]

14 **(a)** Carlos invests \$24 000 at a rate of 3.2% per year compound interest.

View solution

Calculate the value of his investment at the end of 4 years.

\$ ..... [2]

(b) Carlos buys a painting for \$$x$.
He sells the painting for \$40 870.
He makes a profit of 34%.

View solution

Calculate the value of his profit.

\$ ..... [3]

(c) Carlos also buys a car with a value of \$32 500.
The value of the car decreases exponentially by 23% each year.

View solution

Find a formula for the value, \$$V$, of the car at the end of n years.

..... [3]

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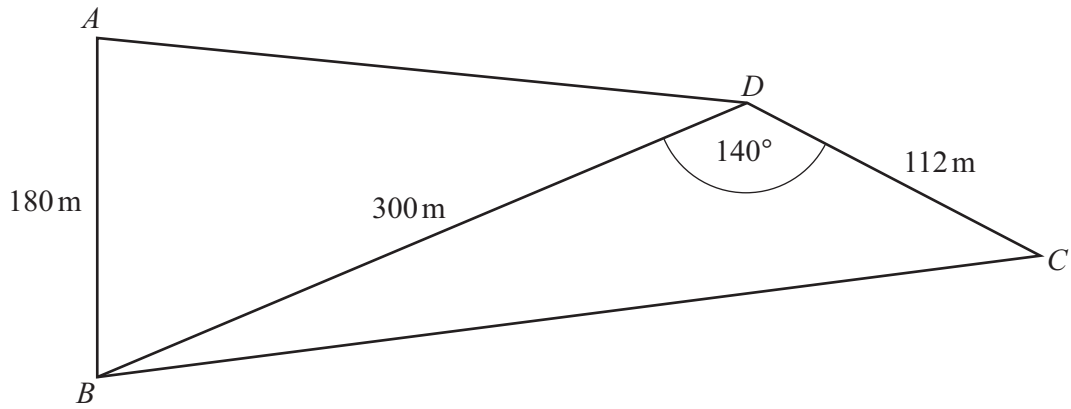
15



NOT TO SCALE

The diagram shows a field, *ABCD*, in the shape of a quadrilateral.
BD is a straight path across the field.

(a) Calculate *BC*.

View solution

BC = ... m [3]

(b) Calculate angle *DBC*.

View solution

Angle *DBC* = ... [3]

(c) The total area of the field, *ABCD*, is 35 900 m^2.

View solution

Work out the length of the shortest distance from *D* to *AB*.

..... m [4]

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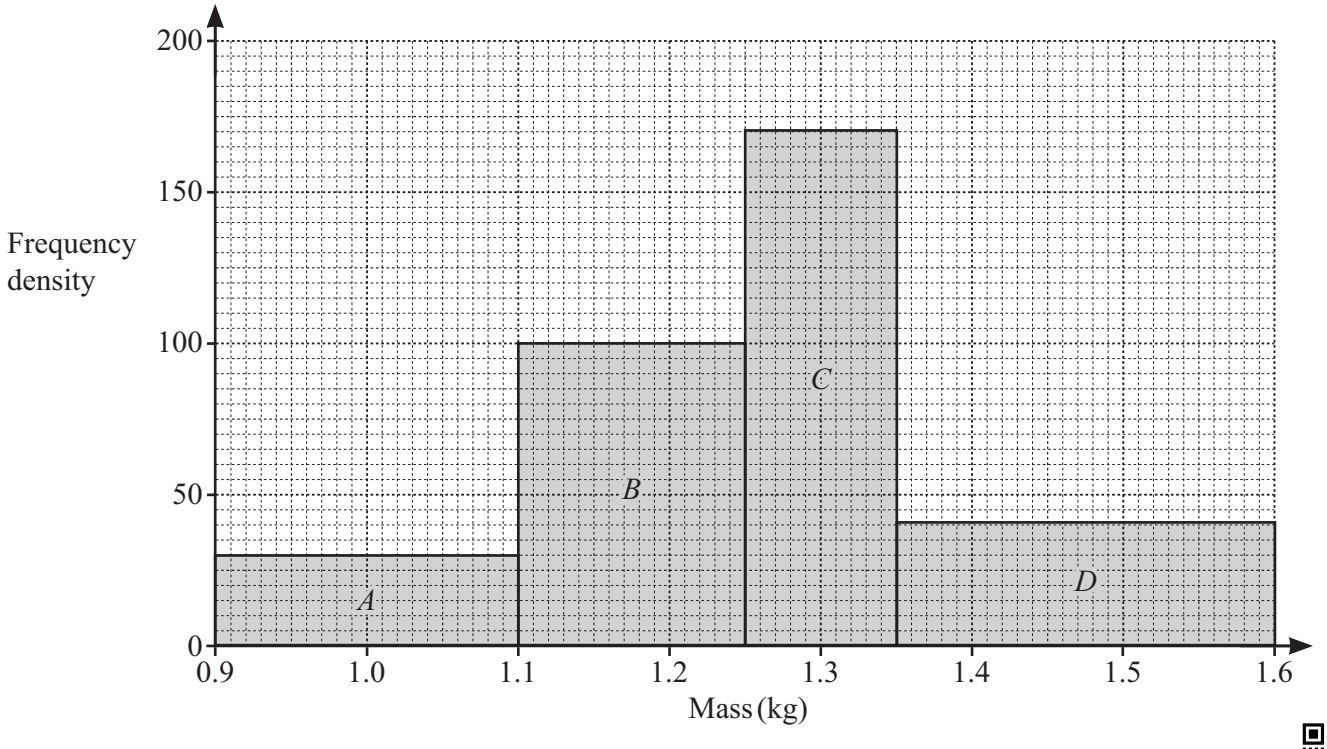
16 The histogram shows information about the masses of some coconuts.
The masses are classified into four categories *A*, *B*, *C* and *D*.



(a) Show that there are 10 coconuts in category *D*.

View solution

[1]

(b) Two of the coconuts from those in category *C* and category *D* are chosen at random.

Find the probability that both are from category *D*.

View solution

..... [3]

(c) Calculate an estimate of the mean mass of the coconuts.

View solution

..... kg [4]

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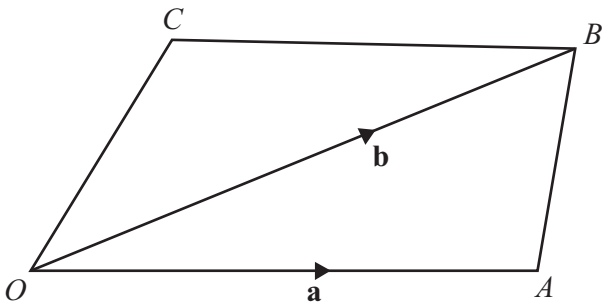
17 Expand and simplify.

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

View solution

..... [3]

18



NOT TO SCALE

In the diagram, OA is parallel to CB.
$OA : CB = 4 : 3$
$\overrightarrow{OA} = \mathbf{a}$ and $\overrightarrow{OB} = \mathbf{b}$.

(a) Find $\overrightarrow{AB}$ in terms of **a** and **b**.

View solution

$\overrightarrow{AB} =$ ..... [1]

(b) M is the midpoint of OC.

Find $\overrightarrow{AM}$ in terms of **a** and **b**.
Give your answer in its simplest form.

View solution

$\overrightarrow{AM} =$ ..... [3]

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19 Solve the simultaneous equations.
You must show all your working and give your answers correct to 2 decimal places.

View solution

$y = 5 - 2x$

$y = 3x^2 - 7x - 6$

$x =$ ..... $y =$ .....

$x =$ ..... $y =$ .....

[6]

20 A solid metal prism has a mass of 4810 g, correct to the nearest 10 g.
The density of the metal is 7.7 g/cm^3, correct to 1 decimal place.

View solution

Calculate the lower bound for the volume of the prism.
[Density = mass ÷ volume]

..... cm^3 [3]

21 y is inversely proportional to $(x+2)^2$.
w is proportional to x.

View solution

When $y = 8$, $x = 3.5$.
When $w = 15$, $x = 90$.

Find y in terms of w.

$y =$ ..... [4]

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