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0580/32

May/June 2019

2 hours

Additional Materials: Electronic calculator Geometrical instruments
Tracing paper (optional)

READ THESE INSTRUCTIONS FIRST

DO **NOT** WRITE IN ANY BARCODES.

For π , use either your calculator value or 3.142.

The total of the marks for this paper is 104.

This document consists of **16** printed pages.

- 1 (a) (i) Write 26% as a decimal.

..... [1]

- (ii) Write 0.48 as a fraction.

..... [1]

- (b) Write down

- (i) a fraction that is equivalent to $\frac{5}{9}$,

..... [1]

- (ii) the 7th odd positive number,

..... [1]

- (iii) a decimal number that is larger than 0.0467 but smaller than 0.0468 .

..... [1]

- (c) Find the value of

- (i) $\sqrt[3]{512}$,

..... [1]

- (ii) $\frac{6^8}{2^6}$,

..... [1]

- (iii) 7^0 .

..... [1]

- (d) Find the first even multiple of seven that is greater than 100.

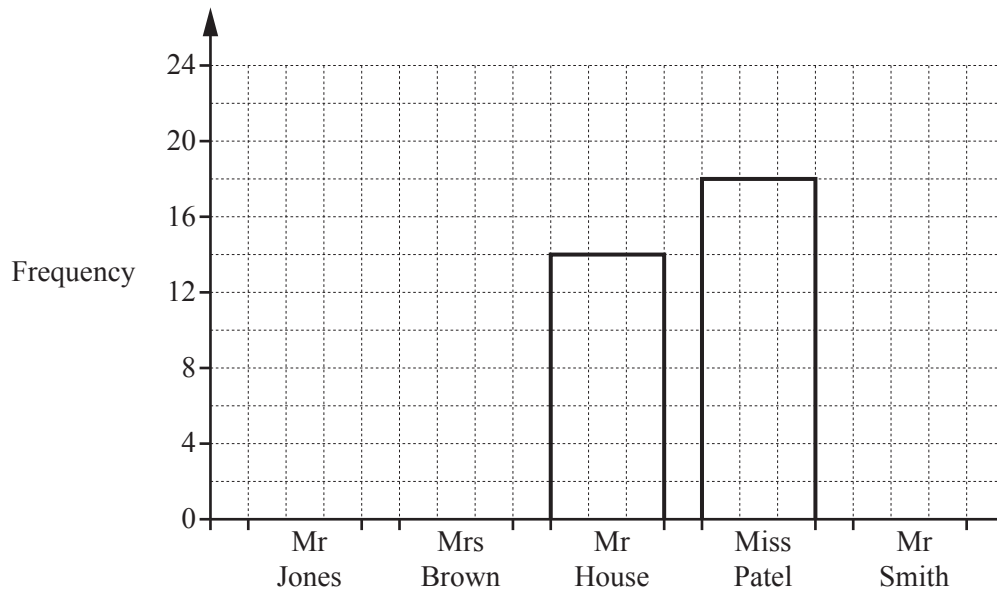
..... [2]

- (e) 6^{-1} $\sqrt{10}$ 8.97×10^{-3} $\frac{7}{5}$ $\sqrt{64}$

From the list, write down the irrational number.

..... [1]

- 2 80 students each record the name of their mathematics teacher.
The number of these students taught by Mr House and by Miss Patel are shown in the bar chart.



- (a) How many more students are taught by Miss Patel than by Mr House?

..... [1]

- (b) 15 students are taught by Mr Smith.
Twice as many students are taught by Mrs Brown than by Mr Jones.

Use this information to complete the bar chart.

[4]

- (c) Write down the mode.

..... [1]

- (d) One of these students is chosen at random.

Work out the probability that this student

- (i) is taught by Mr House,

..... [1]

- (ii) is not taught by either Mr House or Miss Patel.

..... [2]

- (e) This information is also to be shown in a pie chart.

Work out the sector angle for Miss Patel.

..... [2]

3 Mr Lester has a fruit and vegetable shop.

- (a) Apples cost 32 cents each.
Suki buys 6 apples.

Work out the change Mr Lester gives Suki when she pays with a \$10 note.

\$ [2]

- (b) Green grapes cost \$3.10 per kilogram.
Red grapes cost \$2.80 per kilogram.

Work out the total cost of buying 0.6 kg of green grapes and $\frac{3}{4}$ kg of red grapes.

\$ [3]

- (c) George spends \$12 on fruit each week.
The total amount he spends on food is \$75.

Work out the percentage of the \$75 he spends on fruit.

.....% [1]

- (d) Mr Lester buys pineapples for \$1.50 each.
He makes 60% profit when he sells them.

Work out the selling price of a pineapple.

\$ [2]

- (e) The table shows the number of bananas bought by the last 50 customers.

Number of bananas bought	Frequency
0	14
1	0
2	2
3	5
4	11
5	8
6	10

- (i) Find the range.

..... [1]

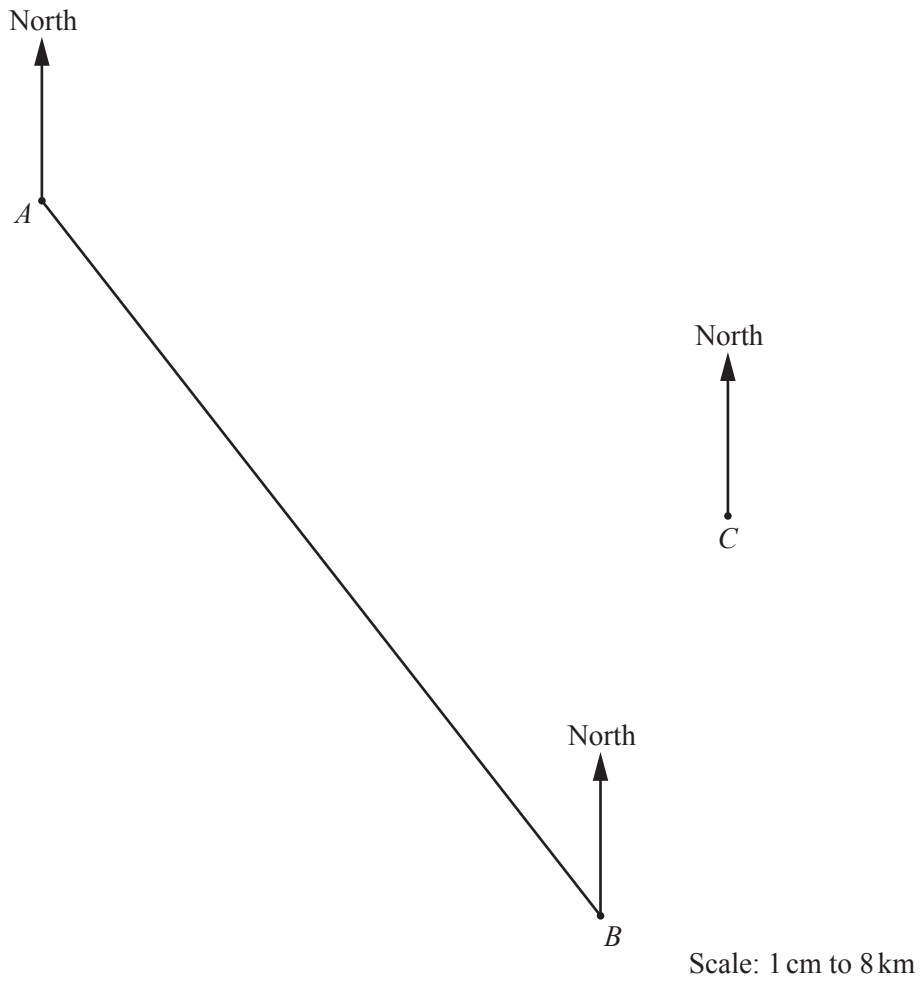
- (ii) Work out the median.

..... [1]

- (iii) Calculate the mean.

..... [3]

- 4 The scale drawing shows town A , town B and town C on a map.
There is a straight road between town A and town B .
The scale of the map is 1 centimetre represents 8 kilometres.



- (a) Measure the bearing of town A from town B .

..... [1]

- (b) Work out the actual distance, in kilometres, between town A and town B .

..... km [2]

- (c) Write the scale of the map in the form 1 : n .

1 : [1]

- (d) A straight road from town C is on a bearing of 246° .
It meets the road from town A to town B at point X .

On the map, draw the road from town C to point X .
Label the position of X .

[1]

- (e) (i) Josie is at point X at 10 50.
She arrives at town B 37 minutes later.

Work out the time that she arrives at town B .

..... [1]

- (ii) Sammy leaves town A and travels to town B at a constant speed of 75 km/h.

- (a) Work out the time for this journey.
Give your answer in hours and minutes, correct to the nearest minute.

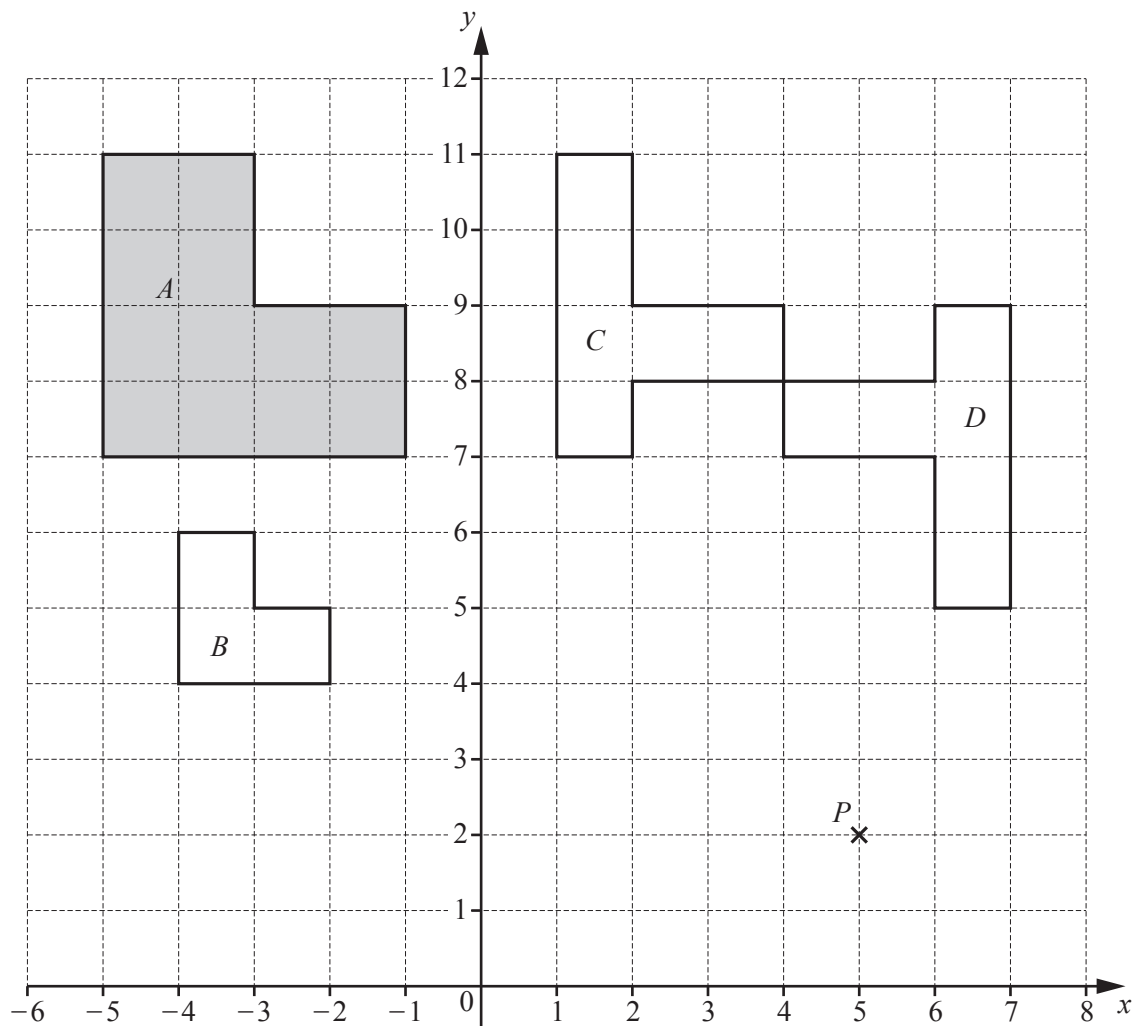
..... h min [3]

- (b) Sammy wants to arrive at town B at the same time as Josie.

Work out the time that Sammy must leave town A .

..... [1]

- 5 The diagram shows four shapes A , B , C and D and a point P on a 1 cm^2 grid.



(a) Find

(i) the perimeter of shape A ,

..... cm [1]

(ii) the area of shape A .

..... cm^2 [1]

- (b) (i) Write down the co-ordinates of point P .

(..... ,) [1]

- (ii) Find the co-ordinates of the image of point P when

- (a) P is reflected in the y -axis,

(..... ,) [1]

- (b) P is reflected in the line $y = 6$.

(..... ,) [2]

- (iii) Find the vector that translates point P to the point $(49, -12)$.

$\begin{pmatrix} \\ \end{pmatrix}$ [2]

- (c) Describe fully the **single** transformation that maps

- (i) shape A onto shape B ,

.....
 [3]

- (ii) shape C onto shape D .

.....
 [3]

- 6 (a) The grid shows the first three diagrams in a sequence.

Each diagram is made using identical small squares.

Each square has sides that are 1 unit long.

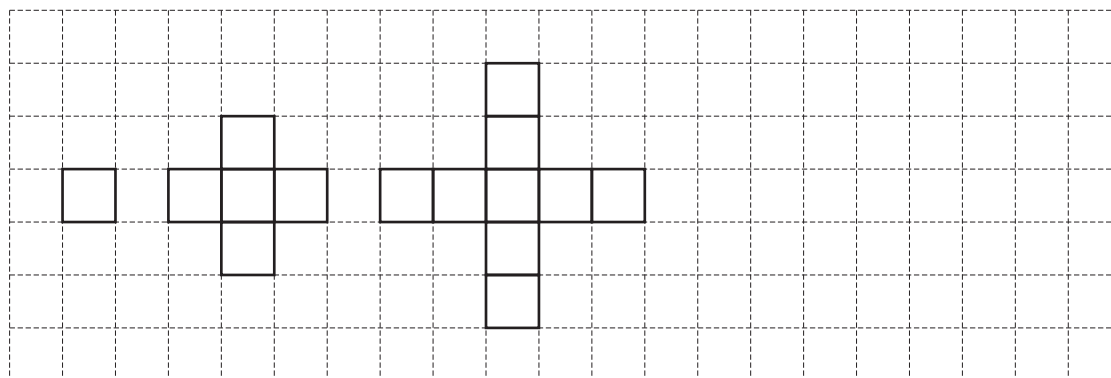


Diagram 1

Diagram 2

Diagram 3

Diagram 4

- (i) On the grid, draw Diagram 4.

[1]

- (ii) Complete the table.

Diagram number	1	2	3	4
Perimeter	4	12	20	

[1]

- (iii) Find an expression, in terms of n , for the perimeter of Diagram n .

..... [2]

- (iv) For one of the diagrams in the sequence the perimeter is 300 units.

Work out its Diagram number.

..... [2]

- (v) **Diagram 3** is drawn on a piece of card.

The side of each small square is 7 cm.

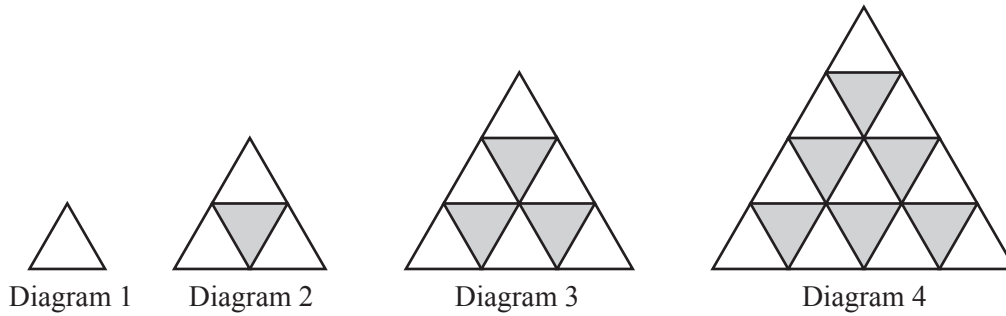
The diagram is the net of an open box.

Calculate the volume of this box.

Give the units of your answer.

..... [3]

- (b) These are the first four diagrams in a sequence.
Each diagram is made from small equilateral triangles.



- (i) Write down the number of lines of symmetry of Diagram 3.

..... [1]

- (ii) Complete the table.

Diagram number (n)	1	2	3	4
Number of white triangles (w)	1	3	6	
Number of grey triangles (g)	0		3	
Total number of small triangles (t)	1	4		

[2]

- (iii) Find a formula, in terms of n , for the total number of small triangles, t , in Diagram n .

$t =$ [1]

- (iv) The formula for the number of white triangles, w , in Diagram n is $w = \frac{1}{2}n(n+1)$.

Show that this formula gives the correct number of white triangles when $n = 3$.

[2]

- (v) Complete this statement for Diagram 15.

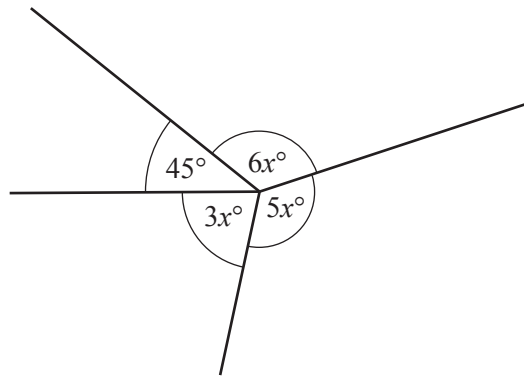
When $n = 15$, $w =$, $g =$ and $t =$ [3]

- 7 (a) A triangle is isosceles.
One of its angles is 96° .

Find the other two angles.

..... and [1]

(b)



NOT TO
SCALE

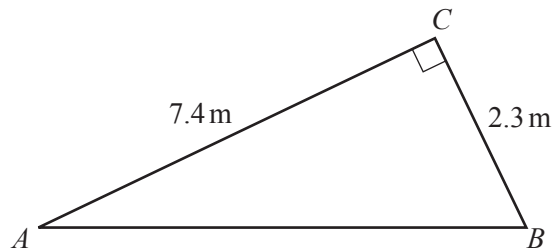
Find the value of x .

$x =$ [4]

- (c) Work out the size of one interior angle of a regular polygon with 20 sides.

..... [3]

(d)



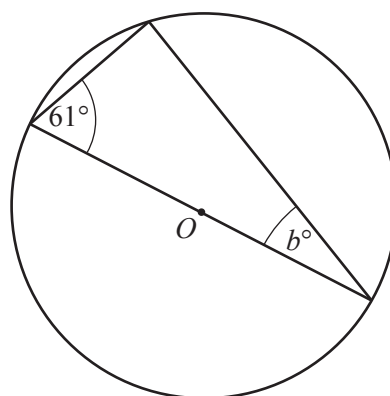
NOT TO
SCALE

The diagram shows a right-angled triangle ABC .

Calculate the length of AB .

$AB =$ m [2]

- (e) The diagram shows the vertices of a triangle lying on the circumference of a circle with centre O .



NOT TO
SCALE

Find the value of b .
Give a reason for your answer.

$b =$ because [2]

- 8 (a) (i) Write down the co-ordinates of the point where the line $y = 6x - 3$ crosses the y -axis.

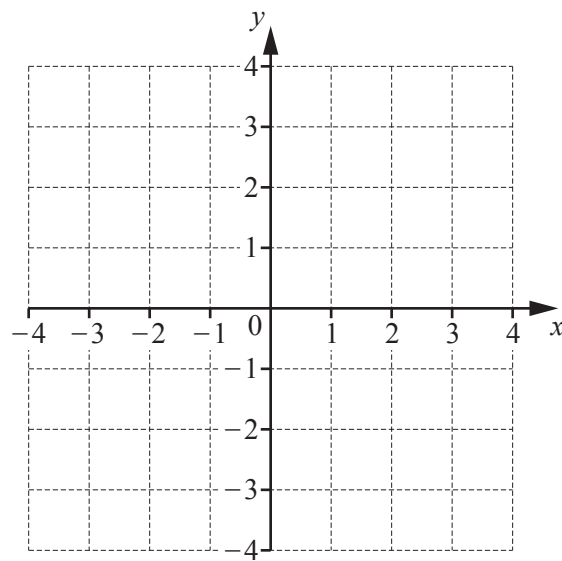
(.....,) [1]

- (ii) Write down the equation of the straight line that

- passes through the origin
- and
- is parallel to $y = 6x - 3$.

..... [1]

(b)



- (i) On the grid, draw the line through the point $(-3, -2)$ that is perpendicular to the y -axis.

[1]

- (ii) On the grid, draw the line $y = -2x$.

[1]

- (c) The equations of two straight lines are $y = 3x + 13$ and $y = 7x - 3$.

Use algebra to solve these two simultaneous equations to find the co-ordinates of the point where the lines meet.

You must show all your working.

(..... ,) [3]

Question 9 is printed on the next page.

9 Zach goes on holiday.

- (a) The mass, m kilograms, of his suitcase is 23.5 kg, correct to the nearest 500 g.

Complete this statement about the value of m .

$$\dots\dots\dots \leq m < \dots\dots\dots [2]$$

- (b) The ratio of the costs flights : hotels = 3 : 8.
The cost of the flights is \$861.

Work out the total cost of flights and hotels.

$$\text{\$ } \dots\dots\dots [2]$$

- (c)

$$\text{\$1} = 0.88 \text{ euros}$$

$$\text{\pounds1} = 1.15 \text{ euros}$$

Zach changes \$575 into euros.

He spends 45% of the euros in France.

He changes the euros he does not use into pounds (£) to spend in England.

Work out how many pounds he receives.

$$\text{\pounds } \dots\dots\dots [4]$$

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