

1 Alphonse, his wife and child fly from Madrid to the Olympic Games in Beijing.
The adult plane fare is 450 euros.
The child fare is 68% of the adult fare.

(a) Show that the total plane fare for the family is 1206 euros. Show all your working clearly.

Answer (a)

[3]

(b) The ratio of the money spent on plane fares : accommodation : tickets = 6 : 5 : 3.

Calculate the total cost.

Answer(b) euros [3]

(c) Alphonse changes 500 euros into Chinese Yuan at a rate of 1 euro = 9.91 Chinese Yuan.

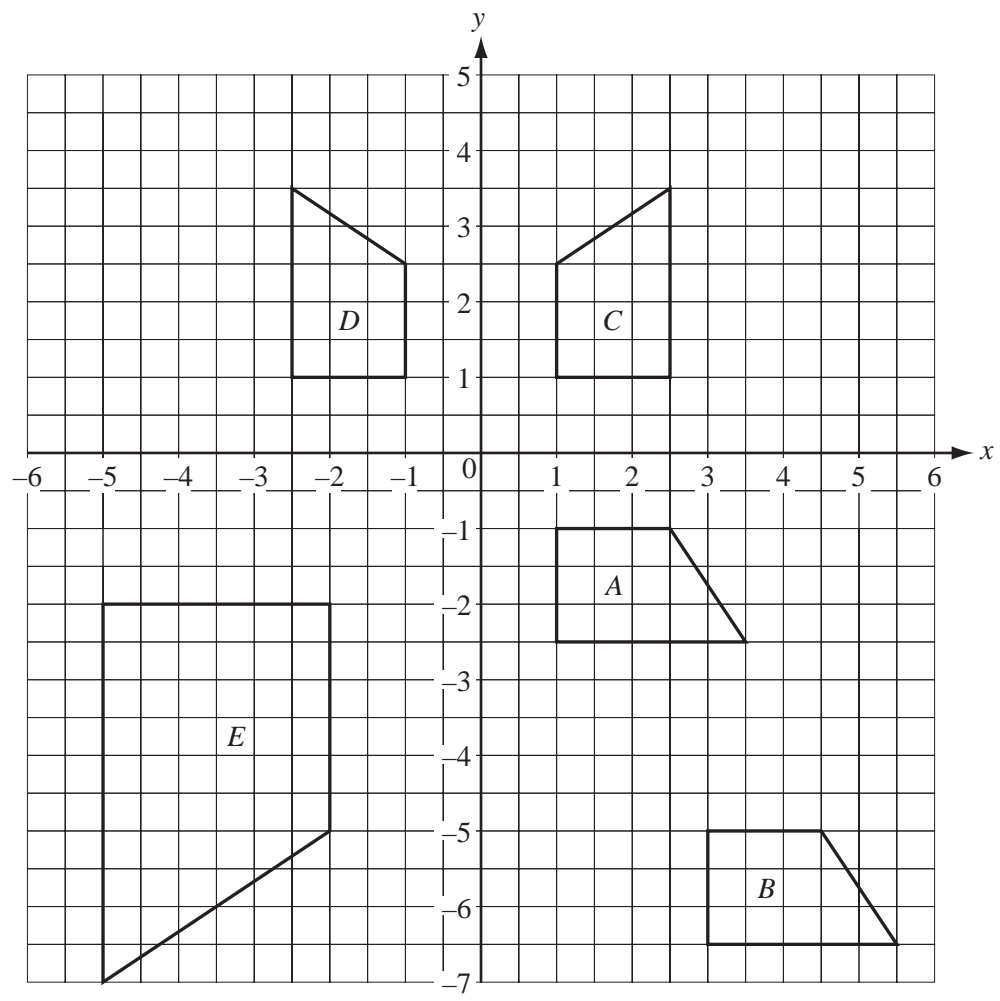
How many Chinese Yuan does he receive?

Answer(c) Yuan [2]

(d) Their plane leaves Madrid at 05 45. The journey takes 11 hours 35 minutes.
Beijing time is 6 hours ahead of Madrid time.

Find the time in Beijing when they arrive.

Answer(d) [2]



Describe fully the **single** transformation which maps

(a) *A* onto *B*,

Answer(a) [3]

(b) *C* onto *D*,

Answer(b) [2]

(c) *A* onto *C*,

Answer(c) [3]

(d) *C* onto *E*.

Answer(d) [3]

3 Marie counts the number of people in each of 60 cars one morning.

(a) She records the first 40 results as shown below.

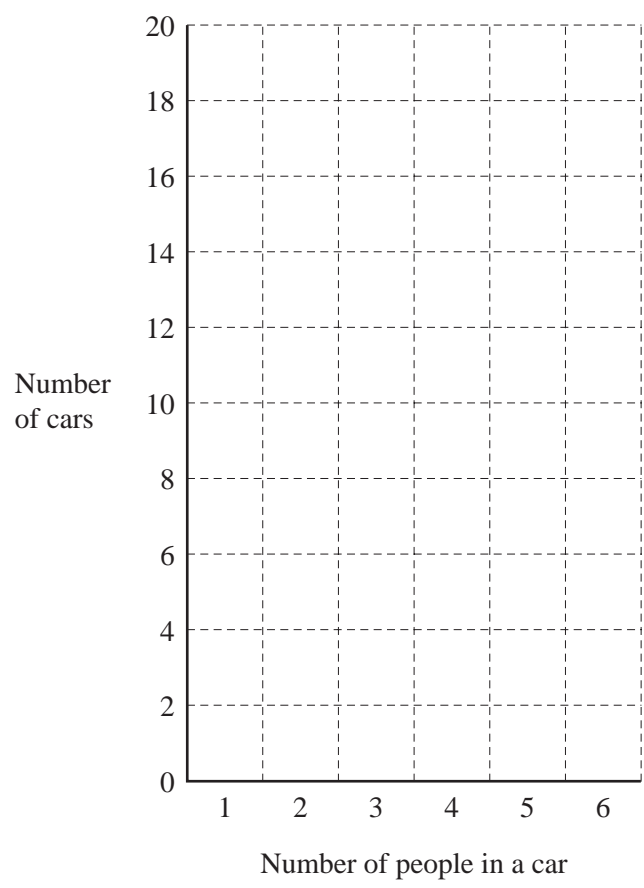
Number of people in a car	Tally	Number of cars
1		
2		
3		
4		
5		
6		

The remaining 20 results are

2, 2, 5, 2, 2, 4, 2, 6, 5, 3, 4, 5, 4, 6, 2, 5, 3, 2, 1, 6.

(i) Use these results to complete the frequency table above. [2]

(ii) On the grid below, draw a bar chart to show the information for the 60 cars.



[1]

5

(iii) Write down the mode.

Answer(a)(iii) [1]

(iv) Find the median.

Answer(a)(iv) [1]

(v) Work out the mean.

Answer(a)(v) [3]

(b) Manuel uses Marie's results to draw a pie chart.

Work out the sector angle for the number of cars with 5 people.

Answer(b) [2]

4 (a) Solve the equations

(i) $3x - 4 = 14,$

Answer(a)(i) $x =$ [2]

(ii) $\frac{y+1}{5} = 2,$

Answer(a)(ii) $y =$ [2]

(iii) $3(2z - 7) - 2(z - 3) = -9.$

Answer(a)(iii) $z =$ [3]

(b) Donna sent p postcards and q letters to her friends.

(i) The total number of postcards and letters she sent was 12.

Write down an equation in p and q .

Answer(b)(i) [1]

(ii) A stamp for a postcard costs 25 cents and a stamp for a letter costs 40 cents. She spent 375 cents on stamps altogether.

Write down another equation in p and q .

Answer(b)(ii) [1]

(iii) Solve these equations to find the values of p and q .

Answer(b)(iii) $p =$ and $q =$ [3]

5 (a) (i) Calculate the area of a circle with radius 3.7 centimetres.

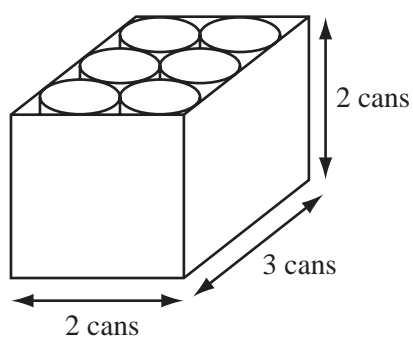
Answer(a)(i) cm² [2]

(ii) A can of tomatoes is a cylinder with radius 3.7 centimetres and height h centimetres. The volume of the cylinder is 430 cubic centimetres.

Calculate h .

Answer(a)(ii) $h =$ [2]

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(b) Twelve cans fit exactly inside a box 3 cans long, 2 cans wide and 2 cans high.

(i) Write down the length, width and height of the box.

Answer(b)(i) length = cm

width = cm

height = cm [3]

(ii) Calculate the volume of the box.

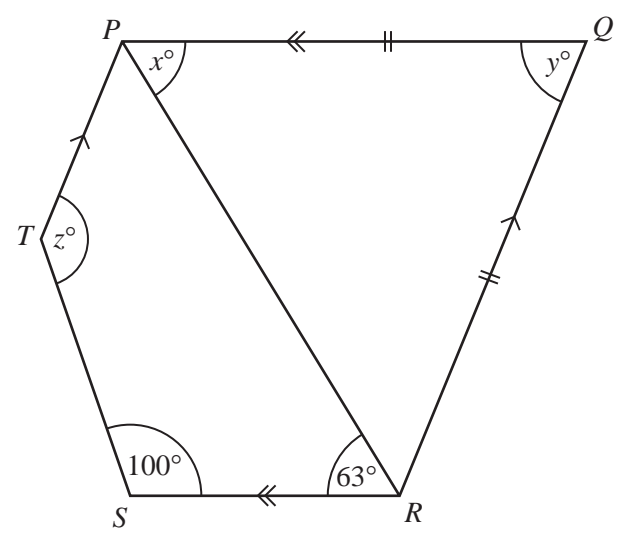
Answer(b)(ii) cm³ [2]

(iii) Calculate the percentage of the volume of the box occupied by the cans.

Answer(b)(iii) % [3]

6

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- (a) In the diagram PQ is parallel to SR , and QR is parallel to PT .
 $PQ = QR$, angle $PRS = 63^\circ$ and angle $RST = 100^\circ$.

Find the value of

- (i) x ,

Answer(a)(i) $x =$ [1]

- (ii) y ,

Answer(a)(ii) $y =$ [2]

- (iii) z .

Answer(a)(iii) $z =$ [2]

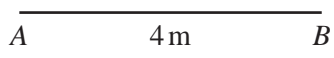
- (b) The shape of a flower bed is a regular octagon, $ABCDEFGH$, with sides of 4 metres.

- (i) Show that the interior angle of a regular octagon is 135° .

Answer(b)(i)

- (ii) Use a ruler and protractor to complete an accurate scale drawing of the flower bed.
Use a scale of 1 centimetre to represent 1 metre.
The line AB and the centre O are already shown.

$O \bullet$



[2]

- (iii) Measure and write down the distance from the centre, O , to the mid-point of AB .

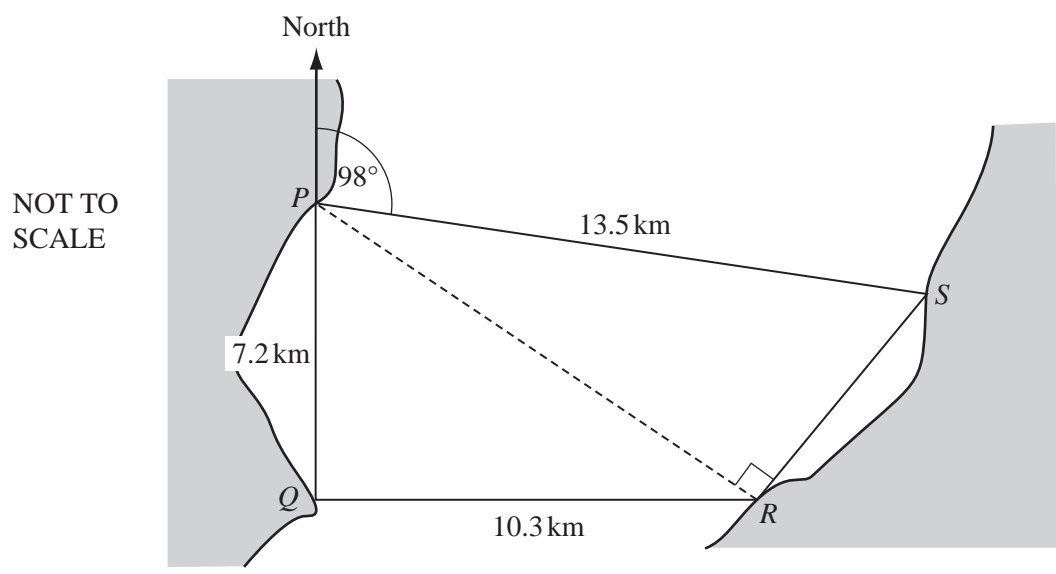
Answer(b)(iii) cm [1]

- (iv) Calculate the area of triangle OAB in the scale drawing.

Answer(b)(iv) cm^2 [2]

- (v) Calculate the actual area of the flower bed.

Answer(b)(v) m^2 [1]



P, Q, R and S are ferry ports on a wide river, as shown in the diagram above.

A ferry sails from P , stopping at Q, R and S before returning to P .

(a) Q is 7.2 kilometres due south of P and R is 10.3 kilometres due east of Q .

(i) Show by calculation that angle $QPR = 55^\circ$.

Answer(a)(i)

[2]

(ii) Write down the bearing of R from P .

Answer(a)(ii)

[1]

(b) The bearing of S from P is 098° and $SP = 13.5$ km.

(i) Explain why angle $RPS = 27^\circ$.

Answer (b)(i)

[1]

(ii) Angle $PRS = 90^\circ$. Calculate the distance RS .

Answer(b)(ii) $RS =$ km [2]

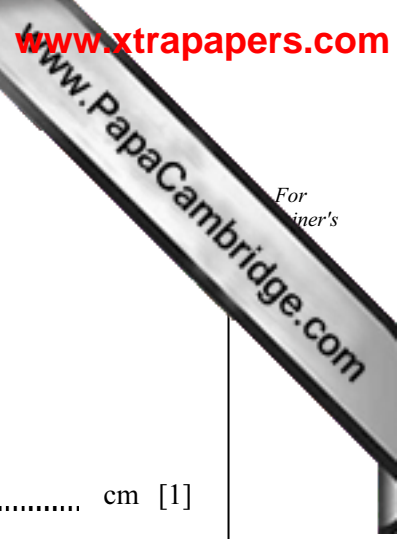
(ii) Find the total distance the ferry sails.

Answer(b)(iii) km [1]

(c) The total sailing time for the ferry is 4 hours 30 minutes.

Calculate the average sailing speed, in kilometres per hour, for the whole journey.

Answer(c) km/h [2]



8 (a) The width of a rectangle is x centimetres.

The length of the rectangle is 3 centimetres more than the width.

Write down an expression, in terms of x , for

(i) the length of the rectangle,

Answer(a)(i) cm [1]

(ii) the area of the rectangle.

Answer(a)(ii) cm^2 [1]

(iii) The area of the rectangle is 7 square centimetres.

Show that $x^2 + 3x - 7 = 0$.

Answer (a)(iii)

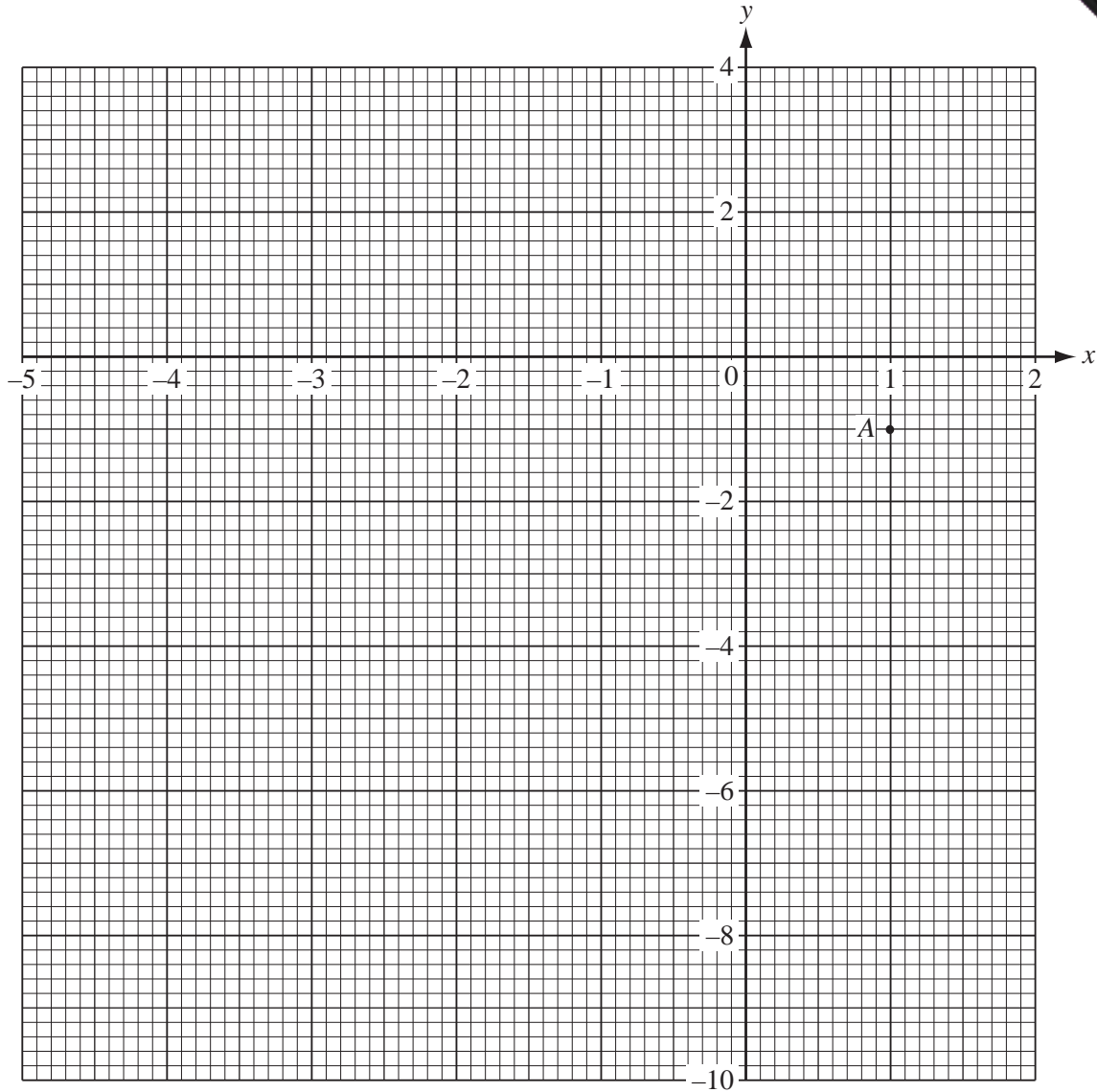
(b) (i) Complete the tables of values for the equation $y = x^2 + 3x - 7$.

[1]

x	-5	-4	-3	-2	-1	0	1	2
y	3		-7	-9		-7		3

[3]

(ii) On the grid below, draw the graph of $y = x^2 + 3x - 7$ for $-5 \leq x \leq 2$.



(c) (i) Use your graph to find the solutions to the equation $x^2 + 3x - 7 = 0$. [4]

Answer(c)(i) $x = \dots\dots\dots$ or $x = \dots\dots\dots$ [2]

(ii) Find the length of the rectangle in part (a).

Answer(c)(ii) $\dots\dots\dots$ cm [1]

(d) The point $A(1, -1)$ is marked on the grid.

(i) Draw a straight line through A with a gradient of 2. [1]

(ii) Write down the equation of this line in the form $y = mx + c$.

Answer(d)(ii) $y = \dots\dots\dots$ [2]

9 In this question, all construction arcs must be shown clearly.

Jalal buys an area of land on which to build a school.

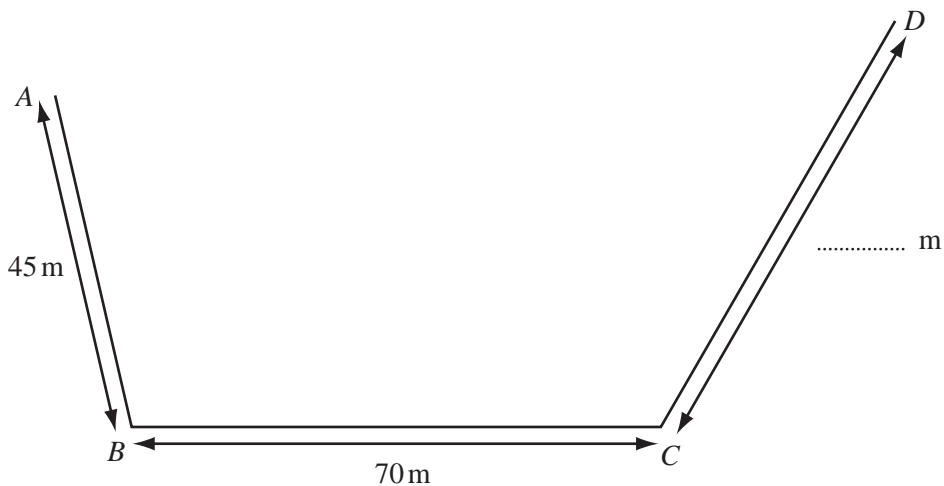
The land, $ABCDE$, is in the shape of a polygon with 5 sides.

(a) Write down the mathematical name of this polygon.

Answer(a) [1]

(b) Jalal starts to make an accurate plan of the land, as shown below.

He uses a scale of 1 centimetre to represent 10 metres.



(i) The actual lengths of AB and BC are written on the plan.

Write the actual length of CD on the plan. [1]

(ii) Use compasses to find the point E such that $AE = 64$ m and $DE = 58$ m.

Draw the lines AE and DE . [2]

- (c) The land is to be divided into distinct regions.

Construct, using a straight edge and compasses only,

- (i) the perpendicular bisector of BC , [2]
- (ii) the bisector of angle ABC . [2]
- (d) The music department building will be nearer to B than to C **and** nearer to BC than to BA .
Write a letter M on the plan where the music department could be. [1]
- (e) The school gate, PQ , will be 8 metres wide.
It will lie along AB so that $AP = QB$.
Mark P and Q accurately on the plan. [2]
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