SURNAME ..... FIRST NAME .....
(Block capitals please)
JUNIOR SCHOOL ..... SENIOR SCHOOL .....

Independent Schools Examinations Board

COMMON ENTRANCE EXAMINATION AT 13+

MATHEMATICS

PAPER 2: Non-Calculator Paper

Practice Paper 2007–2008

Please read this information before the examination starts.

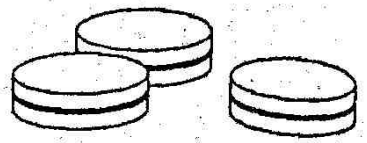
- This examination is 60 minutes long.
- **All** questions should be attempted.
- A row of dots ..... denotes a space for your answer.
- A completely correct answer may receive **no** marks unless you show all your working.
- Answers given as fractions should be reduced to their lowest terms.

S.A. 2837126

1. (a) In a box there are 18 bags each containing 16 toffees.
How many toffees are there in the box?

Answer: ..... toffees (2)

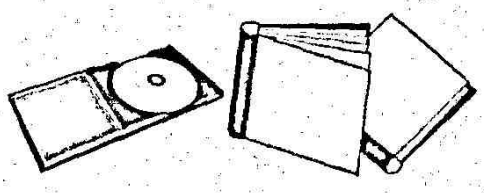
(b) Adam spends £10.47 on three identical cakes.
What is the cost of each cake?



Answer: £ ..... (2)

(c) Bertie wishes to buy a DVD for £8.25 and two books costing £4.99 each.

(i) How much would he spend in total?



Answer: £ ..... (2)

Bertie has not got enough money, so he buys three books for £4.99 each.

(ii) How much less does he have to pay by doing this?

Answer: £ ..... (2)

2. (a) Work out the following:

(i) $2 + 4^2 \times 5$

Answer: ..... (2)

(ii) $\frac{2+4^2}{2}$

Answer: ..... (2)

(iii) $63 \div 7 - 14 \times 2$

Answer: ..... (2)

(b) Insert the correct symbols to make this calculation correct.
You may use +, −, ×, ÷ or brackets as often as you want.

1 2 3 4 = 13

(2)

3. Consider the whole numbers from 1 to 40 inclusive.
From these numbers, write down

(i) the largest prime number

Answer: ..... (1)

(ii) the largest cube number

Answer: ..... (1)

(iii) the largest multiple of 16

Answer: ..... (1)

(iv) the largest factor of 51

Answer: ..... (1)

4. (a) David is awake for $\frac{9}{16}$ of each twenty-four hour day.
For how long is David awake each day?

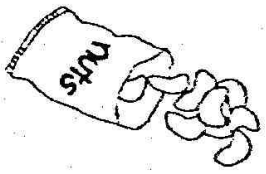
Answer: ..... hours ..... minutes (2)

(b) Morning break at school lasts for $\frac{3}{4}$ of an hour.
Andy spends $\frac{1}{3}$ of his break queuing at the tuck shop.
How many minutes of his break remain?

Answer: ..... min (2)

(c) Bill and Cecily buy a packet of nuts.
Bill eats a quarter of the nuts and Cecily eats a sixth of the nuts in the packet.

(i) What fraction of the number of nuts in the packet has been eaten?



Answer: ..... (2)

They give the remaining 63 nuts to Daniel.

(ii) How many nuts were there in the full packet?

Answer: ..... (2)

5. If $a = 2$ $b = -10$ $c = 8$ find the value of

(i) $3a - c$

Answer: ..... (1)

(ii) $\frac{2ab}{c}$

Answer: ..... (1)

(iii) $(2b)^2 - c^2$

Answer: ..... (2)

(iv) $\frac{\sqrt{b^2 - 4ac}}{2a}$

Answer: ..... (3)

6. $47 \times 23 = 1081$

(i) Use this fact to write down the answer to

(a) 470×230

Answer: ..... (1)

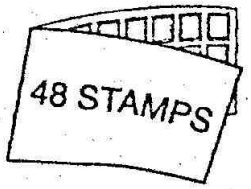
(b) 0.47×2.3

Answer: ..... (1)

(c) $108.1 \div 0.47$

Answer: ..... (2)

(ii) Hence, or otherwise, work out the total cost of 48 stamps costing 23p each.



Answer: £ ..... (2)

7. Peter was given a sum of money for his birthday.

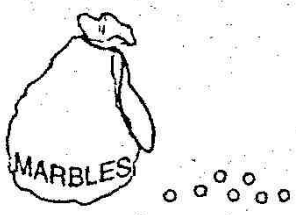
Being generous, he spent $\frac{2}{5}$ of his money buying a large bag of marbles for his sister, Georgie.

(i) If he spent £10 on the marbles, what was the sum of money Peter was given for his birthday?

Answer: £ ..... (2)

Georgie's bag contained 240 marbles, made up only of clear or coloured marbles in the ratio 3 : 5

(ii) (a) How many of the marbles were coloured?



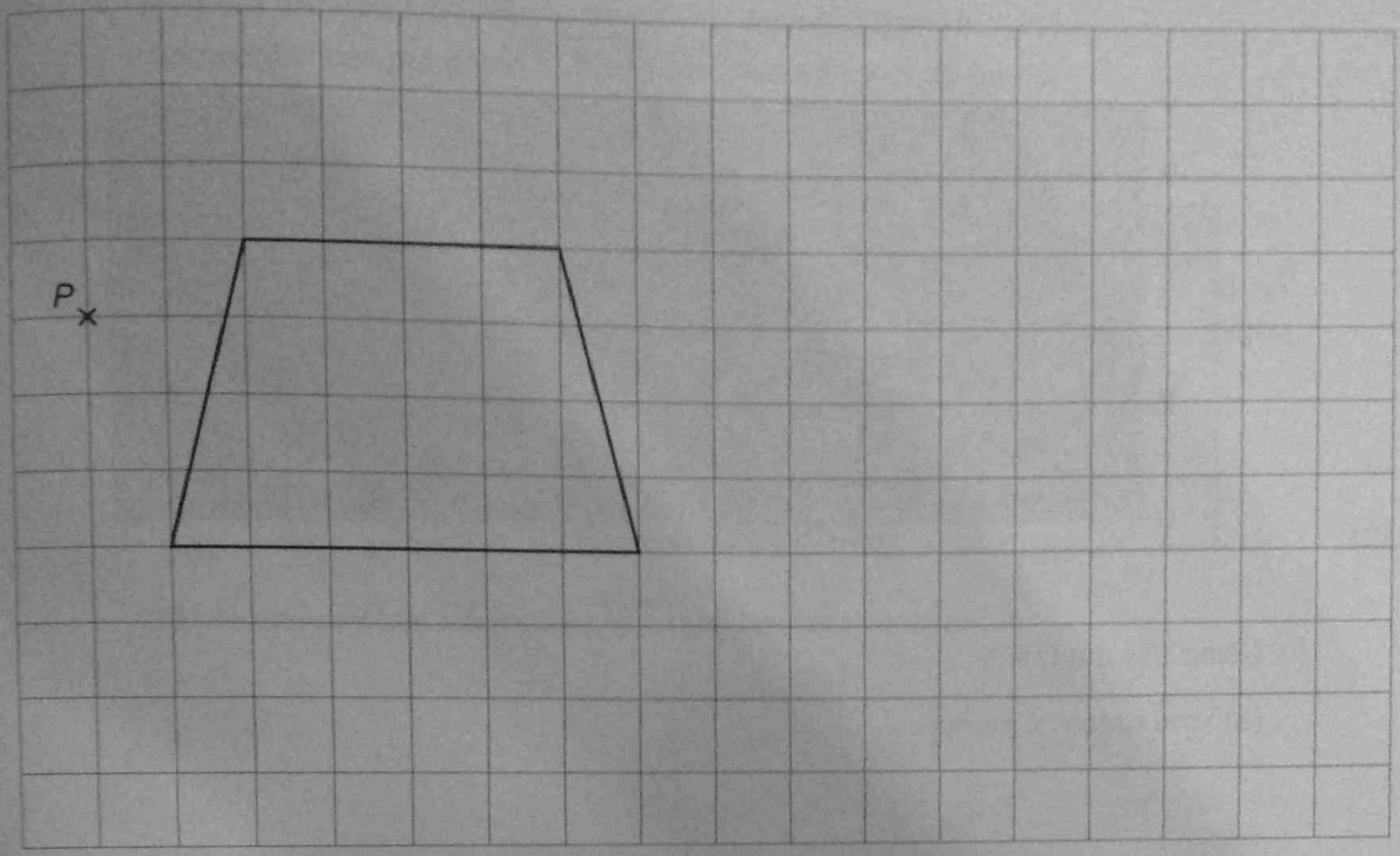
Answer: ..... (2)

Georgie gives 20% of her clear marbles and 60% of her coloured ones to her other brother John.

(b) What percentage of the original number of her marbles does Georgie give to John?

Answer: ..... % (3)

8. A trapezium is drawn on a centimetre-square grid.



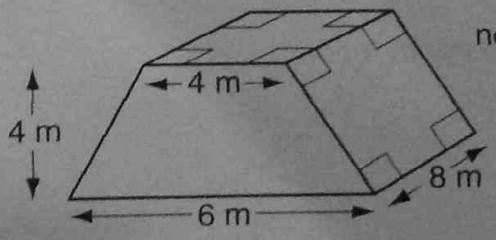
(i) What is the area of the trapezium?

Answer: ..... cm^2 (2)

(ii) With centre P and scale factor 2, draw the enlargement of the trapezium. (2)

(iii) Jack put up a large tent whose cross-section is the shape of the trapezium above.

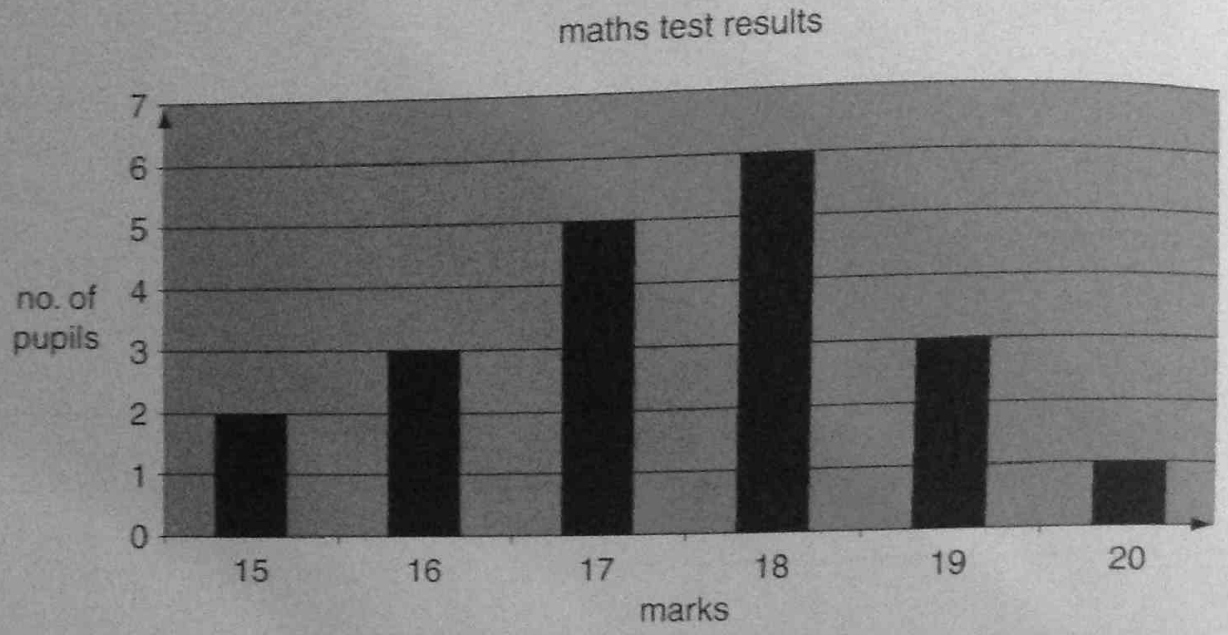
What is the volume of the tent?



not to scale

Answer: ..... m^3 (2)

9. This bar chart shows the marks obtained by 20 children in a recent maths test.



(i) Using this data, find

(a) the range of marks

Answer: ..... (1)

(b) the modal mark

Answer: ..... (1)

(c) the median mark

Answer: ..... (2)

(d) the mean mark.

Answer: ..... (3)

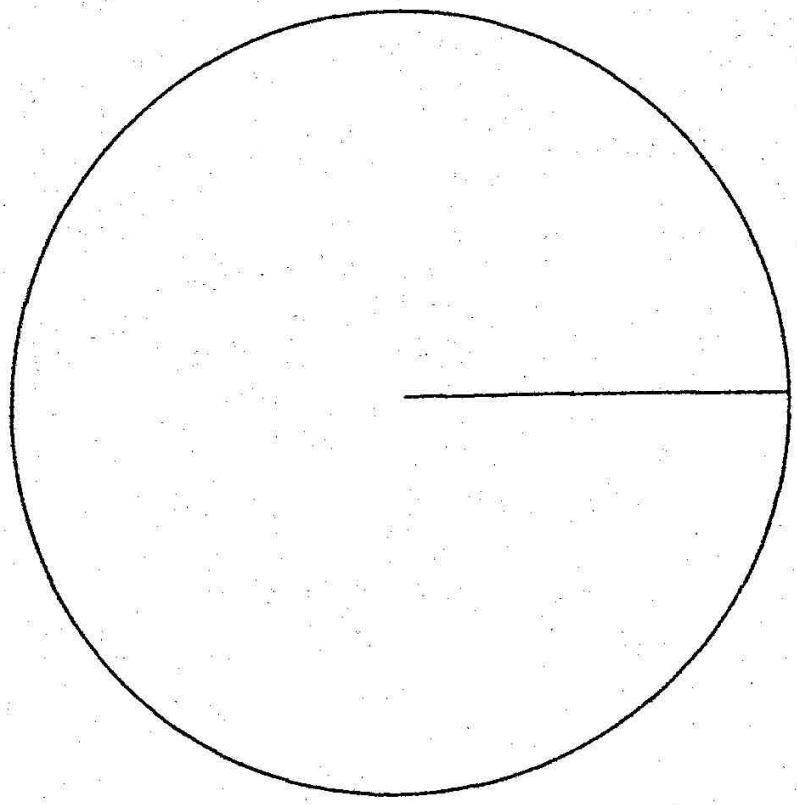
(ii) Bronze certificates are given to those who scored 15 or 16 marks.
Silver certificates are given to those who scored 17 or 18 marks.
Gold certificates are given to those who scored 19 or 20 marks.

(a) Using the bar chart, complete this frequency table:

certificate	marks	frequency
bronze	15–16	
silver	17–18	
gold		4
	total	

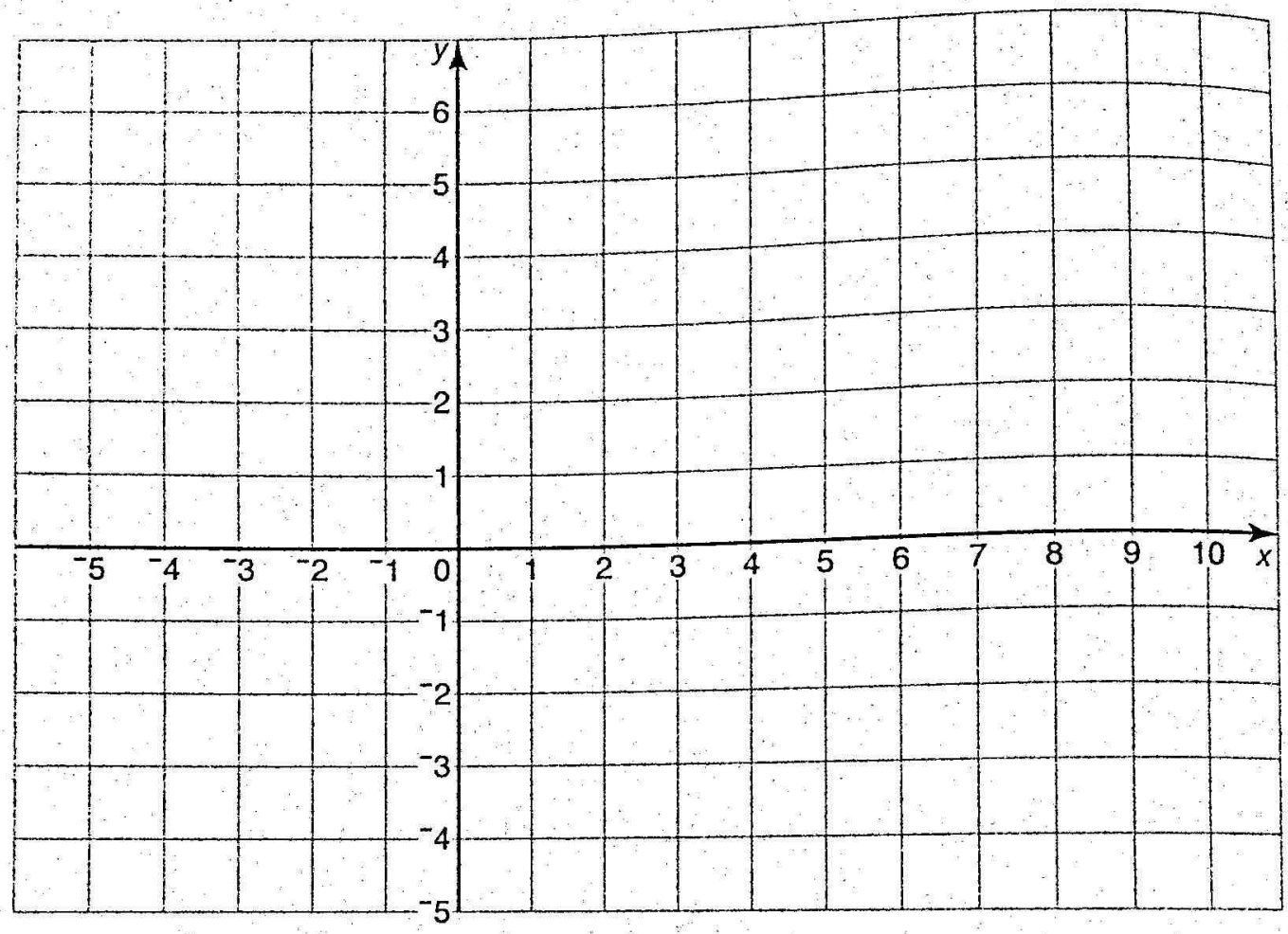
(2)

0 (b) Represent this information in a fully-labelled pie chart.



0 (3)

10. (i) On the grid below, plot the points $(2, -1)$, $(4, -1)$ and $(4, -4)$.
Join the points and label the triangle A. (2)



(ii) Draw and label the line $y = x$ (1)

(iii) Reflect triangle A in the line $y = x$ and label the image B. (1)

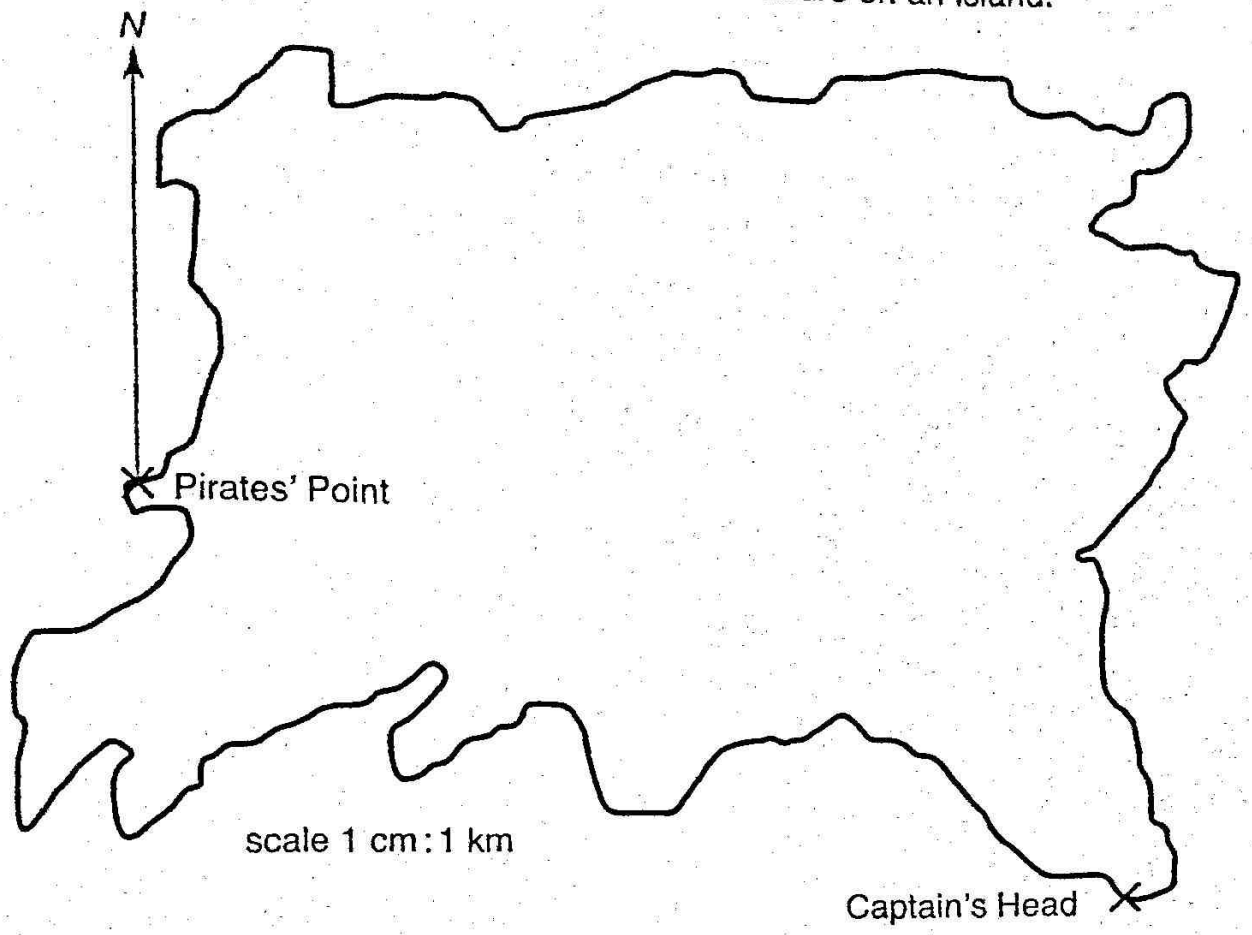
(iv) Rotate triangle A through 90° anticlockwise about (1, 1) and label the image C. (2)

(v) Translate triangle A *6 units to the left* and *2 units up.* Label the image D. (2)

(vi) Describe fully the transformation which maps triangle B on to triangle C.

Answer: ..... (2)

11. Before Captain Orrible was executed, he left Peter and Charlie a map and two clues to locate the exact position of where he had buried treasure on an island.



Peter's Clue: *The treasure is buried on a bearing of 083° from Pirates' Point.*

(i) Draw a line to show where the treasure could lie. (1)

Charlie's Clue: *The treasure is buried exactly 9 km from Captain's Head.*

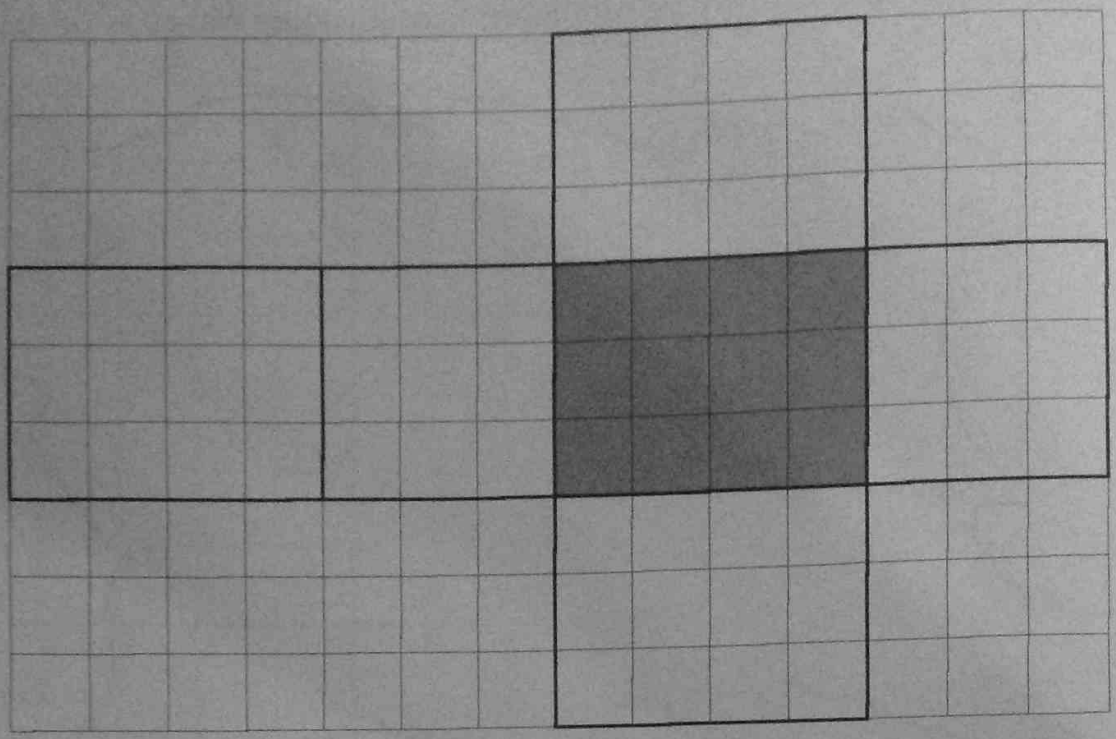
(ii) Use a pair of compasses to find the position of the treasure. Mark it *T*. (1)

Peter leaves Pirates' Point at 10.00 am and walks at 5 km/h towards the treasure. Charlie runs at 12 km/h towards the treasure.

(iii) At what time must she leave Captain's Head in order to reach the same time as Peter?

Answer: ..... (2)

12. The net of a cuboid is shown on the centimetre-square grid. The base is shaded.



(i) Work out the volume of the cuboid.

Answer: ..... cm^3 (2)

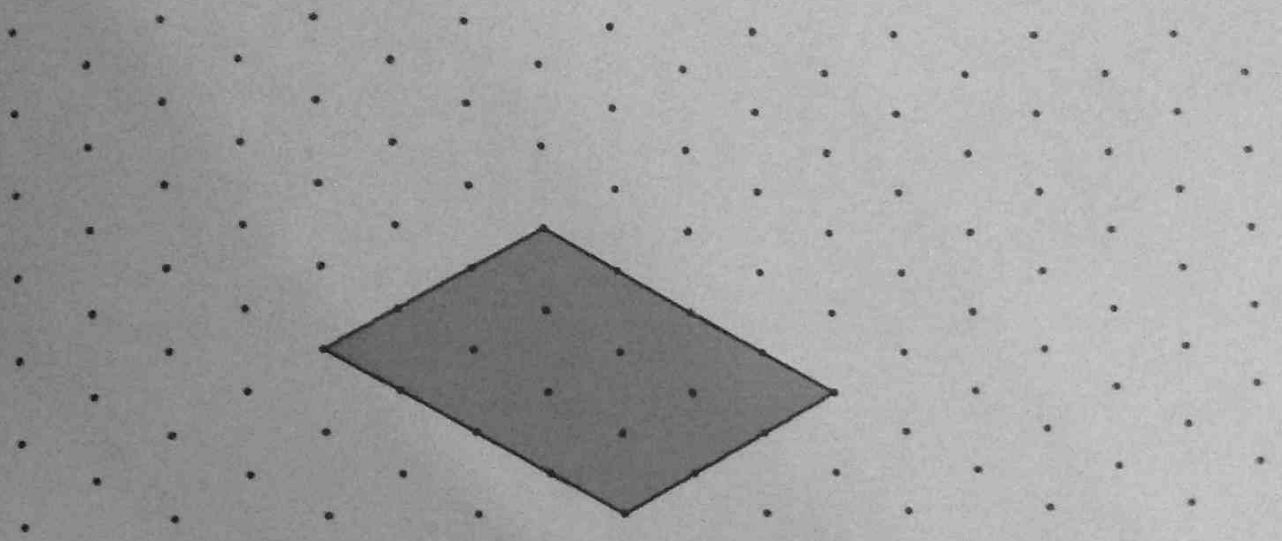
(ii) Work out the surface area of the cuboid.

Answer: ..... cm^2 (2)

(iii) The cuboid is made of a new material called Blob. 1 cm^3 of Blob has a mass of 5 grams. Work out the mass of the cuboid.

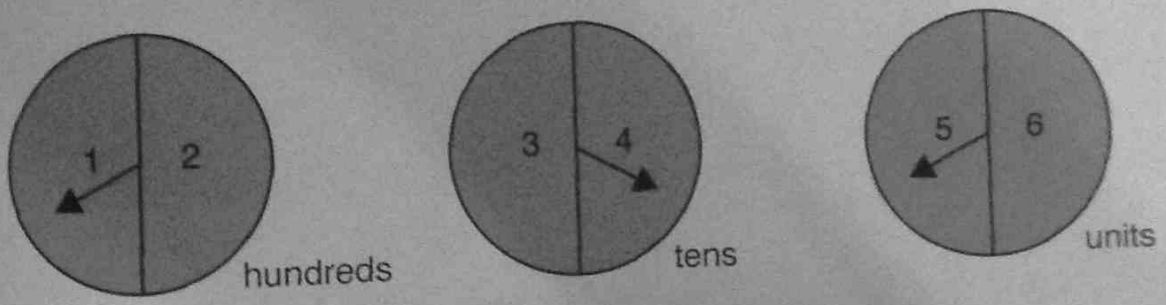
Answer: ..... g (2)

(iv) Another cuboid is made of the same material. It has a mass of 120 grams.
Draw the cuboid on the isometric grid below.
Its base, measuring 3 cm by 4 cm, is already drawn for you.



(3)

13. (i) Sophie spins three fair spinners and uses the digits to form a three-digit number.
The spinners in the diagram show how the number 145 is formed.



(a) List all eight possible numbers which Sophie can form.

Answer: ....., ..., ..., ..., ..., ..., ..., ... (2)

(b) Simplifying your answer, state the probability that Sophie's three-digit number is

(i) a multiple of 5

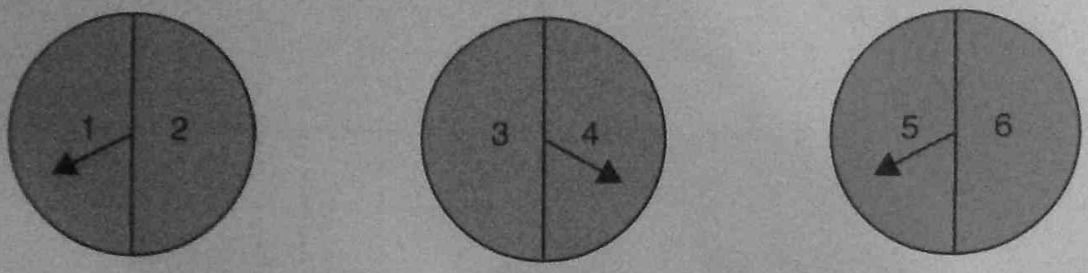
Answer: ..... (1)

(ii) divisible by 3

Answer: ..... (2)

(ii) Sophie now forms mixed numbers with her spinners. The left spinner is used for the whole number. The middle spinner is for the numerator (top) of the fraction and the right spinner for the denominator (bottom).

The spinners in the diagram show how the mixed number $1\frac{4}{5}$ is formed.



whole number numerator denominator

(a) What is the largest mixed number which Sophie can form?

Answer: ..... (1)

(b) What is the difference between the largest and smallest mixed numbers which Sophie can form? Give your answer as a mixed number.

Answer: ..... (3)

(c) Divide the largest mixed number by the smallest one. Give your answer as a mixed number.

Answer: ..... (2)

(Total marks: 100)