GCSE Foundation/Higher 20

Shape, space and measure

Questions

79 minutes

69 marks

Mensuration

Q1. Peter and Alice buy a set of golf clubs for their mother.
They pay in the ratio 4 : 3
Peter pays £224.

How much does Alice pay?

.....

.....

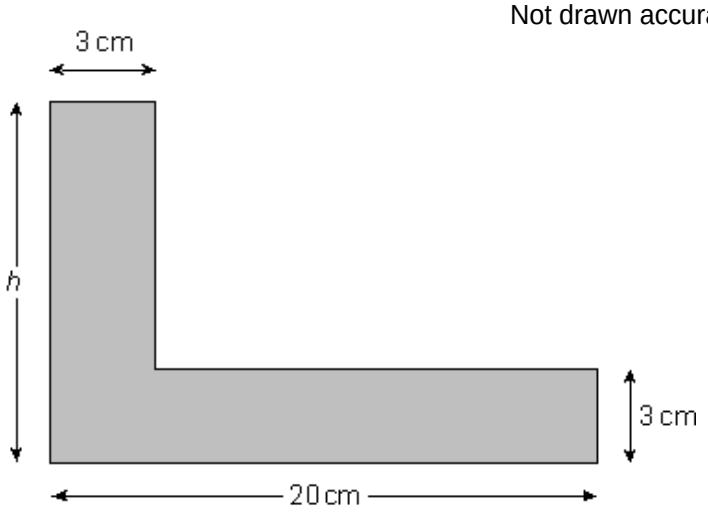
.....

Answer £.....

(Total 3 marks)

Q2. This L-shape has measurements as shown on the diagram.

Not drawn accurately



The perimeter of the shape is 72 cm.

Find the length marked *h* on the diagram.

.....

.....

.....

.....

.....

.....

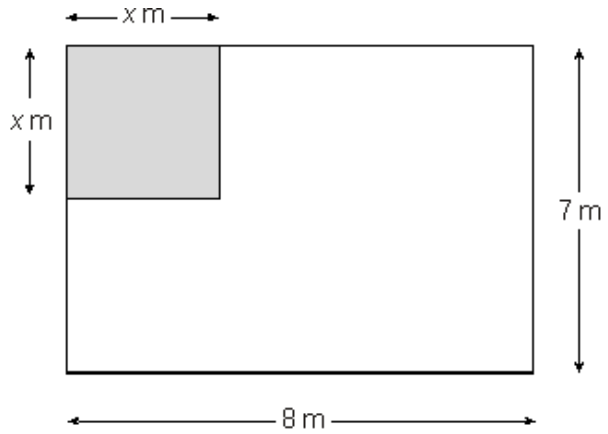
.....

.....

Answer ..... cm

(Total 3 marks)

Q3. A rectangular carpet is 7 metres wide and 8 metres long.
A square piece of side length x metres is cut from one of the corners.



Not drawn accurately

(a) Dean works out the area of the remaining carpet in terms of x.
His answer is $56 - x^2$

Explain how Dean might have obtained his expression.

.....

.....

.....

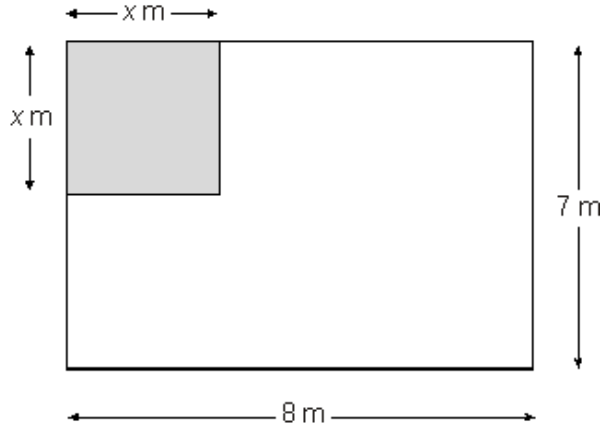
(1)

(b) Lucy also works out the area of the remaining carpet in terms of x.
Her answer is $x(8 - x) + 8(7 - x)$

Use the diagram below to show how Lucy might have obtained her expression.

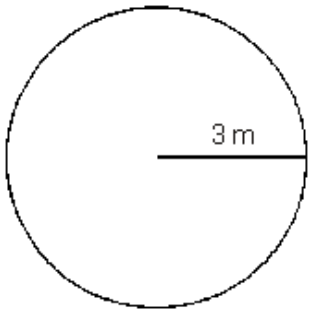
.....

.....



(3)
(Total 4 marks)

Q4. (a) The diagram shows a circle of radius three metres.



Not drawn accurately

Work out the area of the circle.
Give your answer in terms of π.

.....

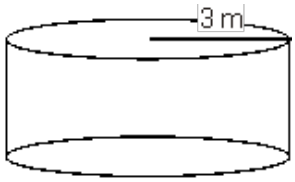
.....

.....

Answer ..... m^2

(2)

(b) The diagram shows a cylindrical water tank.
The cross-section of the tank is a circle of radius three metres.
The depth of water in the tank is 0.5 metres.



Not drawn accurately

Calculate the volume of water in the tank.
Give your answer in terms of π.

.....

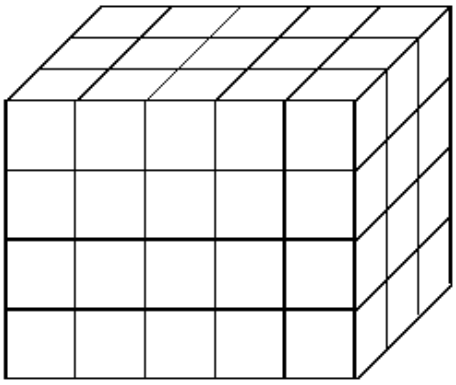
.....

.....

Answer ..... m^3

(2)
(Total 4 marks)

Q5. This cuboid is made from centimetre cubes.



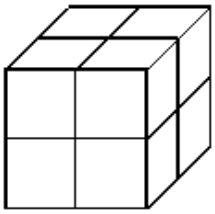
(a) Explain why the total number of cubes needed to make this cuboid is 60.

.....

.....

(1)

(b) The 60 centimetre cubes are separated.
They are then used to make cubes, 2 cm by 2 cm by 2 cm.



How many of these complete cubes can be made?

.....

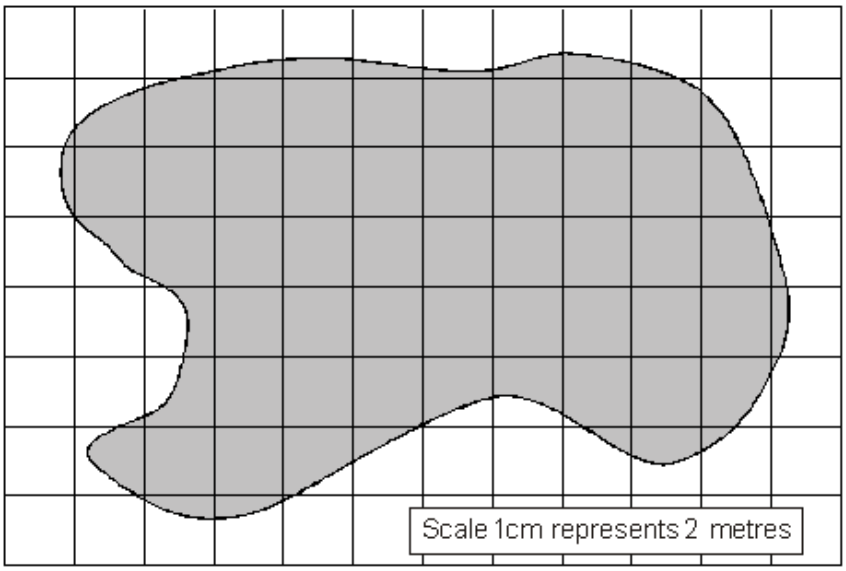
.....

.....

Answer .....

(2)
(Total 3 marks)

Q6. The diagram shows the plan view of a landfill site on a centimetre grid.



(a) Estimate the number of shaded squares in the diagram.
You **must** show your working.

.....

.....

.....

.....

.....

.....

.....

.....

Answer .....

(2)

(b) A landscape gardener is going to cover the site with turf (grass).

The table shows the cost of turf for different areas (m^2).

Area of turf (m^2)	Cost per square metre
40 - 59	£2.83
60 - 130	£2.33
131 - 240	£2.03
241 - 480	£1.78
481 - 640	£1.53
641 - 960	£1.40
961 - 1440	£1.23

On the diagram one square represents $4m^2$.
The landscape gardener must buy enough turf to cover the landfill site.

Work out how much he has to pay.
You **must** show your working.

.....

.....

.....

.....

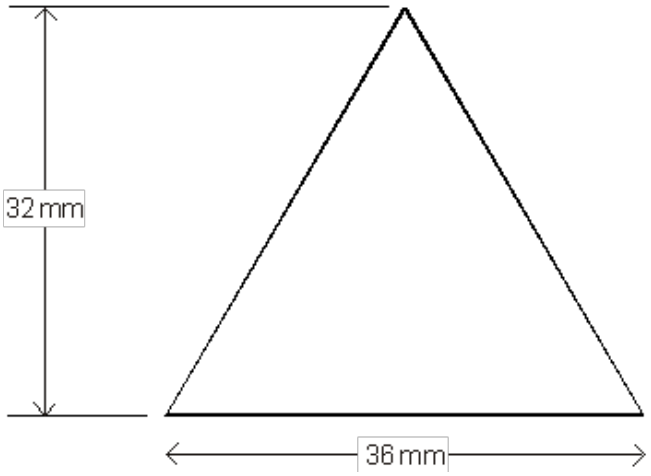
.....

Answer £ .....

(3)
(Total 5 marks)

Q7. The base of a triangle is 36 mm.

The height of the triangle is 32 mm.



Not drawn accurately

(a) Work out the area of the triangle.

.....

.....

.....

.....

Answer ..... mm^2

(2)

(b) The dimensions of the triangle are given to the nearest millimetre.

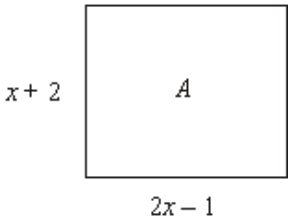
Write down the least possible length of the base of the triangle.

Answer ..... mm

(1)

(Total 3 marks)

Q8. Rectangle *A* has length $(2x - 1)$ cm and width $(x + 2)$ cm.



Not drawn accurately

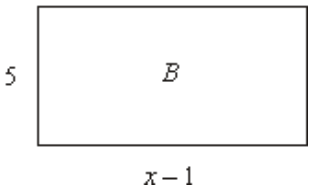
(a) Show that the perimeter of rectangle *A* is (6*x* + 2) cm.

.....

.....

(1)

(b) Rectangle *B* has length (*x* – 1) cm and width 5 cm.



Not drawn accurately

The perimeter of rectangle A is equal to the perimeter of rectangle B.
Write down and solve an equation in *x*.

.....

.....

.....

.....

.....

Answer *x* = ...

(4)

(c) Find the **area** of rectangle *A*.

.....

.....

.....

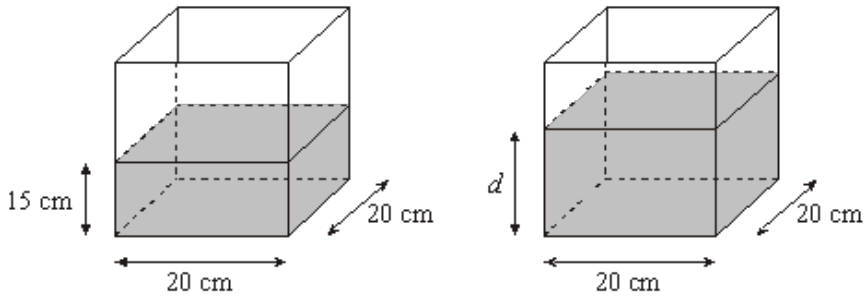
.....

Answer ..... cm^2

(2)
(Total 7 marks)

Q9. A water container is in the shape of a cuboid.
Its base is 20 cm by 20 cm and the depth of the water in the container is 15 cm.
Tony adds 1000 cm^3 of water to the container.

Not drawn accurately



Calculate the new depth, *d*, of the water, in centimetres.

.....

.....

.....

.....

.....

.....

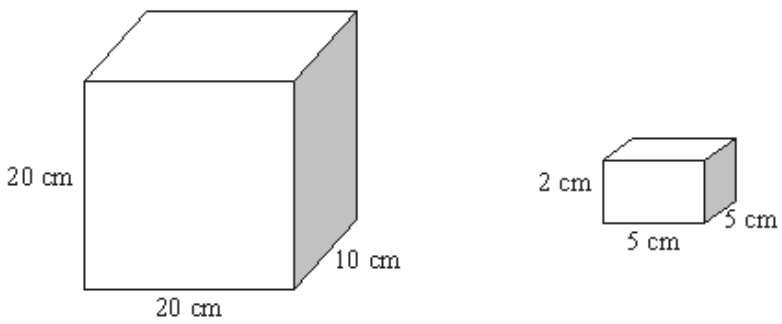
.....

Answer ..... cm

(Total 4 marks)

Q10. The diagram shows two boxes that are cuboids.
The larger box measures 20 cm by 10 cm by 20 cm.
It is partly filled with 70 smaller boxes each measuring 5 cm by 5 cm by 2 cm.
The smaller boxes are packed so that there are no gaps between them.

Not drawn accurately



How many more smaller boxes could be fitted in the larger box?

.....

.....

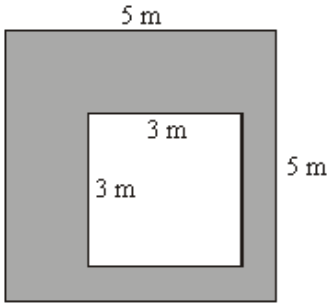
.....

.....

Answer .....

(Total 4 marks)

Q11. What percentage of this shape is shaded?



Not to scale

.....

.....

.....

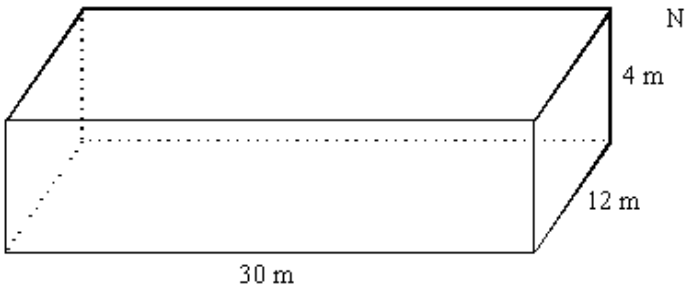
.....

.....

Answer ..... %

(Total 4 marks)

Q12. A school hall is in the shape of a cuboid.



Not to scale

(a) The school hall is 30 m long, 12 m wide and 4 m high.
Calculate the volume of the hall.

.....

.....

.....

Answer ..... m^3

(2)

(b) The school buys **ten** 5 litre tins of paint to paint the hall.

The area to be painted is 279 m^2.

Each tin covers 30 m^2.

Calculate the percentage of paint used.

.....

.....

.....

.....

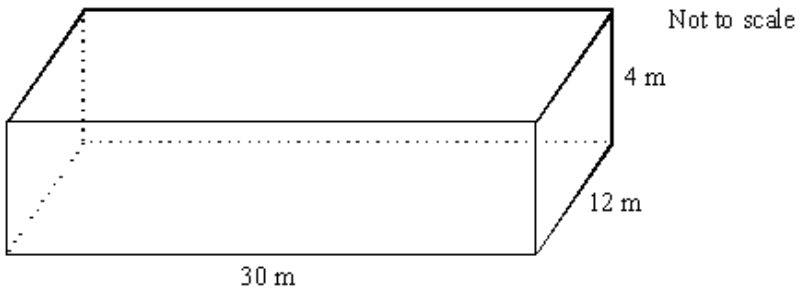
.....

Answer ..... %

(3)

(Total 5 marks)

Q13. A school hall is in the shape of a cuboid.



(a) The school hall is 30 m long, 12 m wide and 4 m high.

(i) Calculate the volume of the hall.

.....

.....

.....

Answer ..... m^3

(2)

(ii) Calculate the total area of the **four walls** of the hall.

.....

.....

.....

.....

.....

.....

Answer ..... m^2

(3)

(b) The school buys **ten** 5 litre tins of paint to paint the hall.

The area to be painted is 279 m^2.

Each tin covers 30 m^2.

Calculate the percentage of paint used.

.....

.....

.....

.....

.....

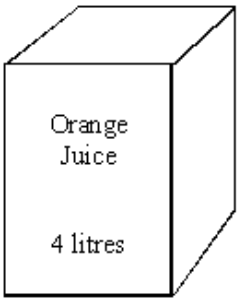
Answer ..... %

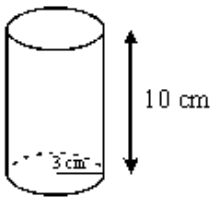
(3)

(Total 8 marks)

Q14. A large carton contains 4 litres of orange juice.

Cylindrical glasses of height 10 cm and radius 3 cm are to be filled from the carton.





How many glasses can be filled?
You **must** show all your working.

.....

.....

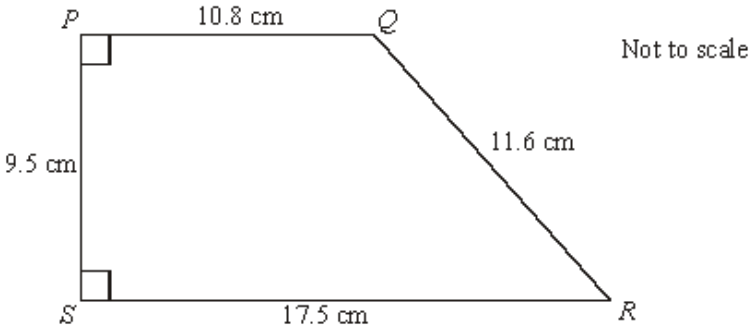
.....

.....

Answer ..... glasses

(Total 5 marks)

Q15. In the diagram below, *PQ* = 10.8 cm, *QR* = 11.6 cm, *RS* = 17.5 cm and *PS* = 9.5 cm.
The angles at *P* and *S* are 90°



Calculate the area of *PQRS*.

.....

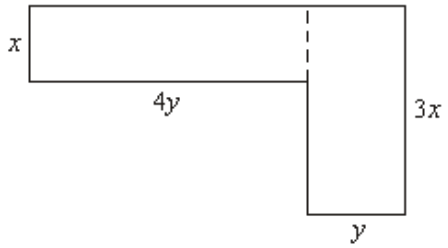
.....

.....

Answer ..... cm^2

(Total 3 marks)

Q16. This shape is made up of rectangles.



Not to scale

(a) Write down an expression, in terms of x and y, for the **perimeter** of the shape.

.....

.....

.....

Answer .....

(2)

(b) If x = 2 cm and y = 5 cm, find the **area** of the shape.

.....

.....

.....

Answer ..... cm^2

(2)

(Total 4 marks)