



EPSOM  
COLLEGE

Epsom College  
Mathematics Department

13+ Academic Scholarship  
Sample Paper

Time Allowed: 45 min  
Total Marks Available: 45  
No calculator allowed

Write all answers in the spaces  
provided. Use blue or black pen only.

COLLEGE ROAD, EPSOM, SURREY, KT17 4JQ  
01372 821000 [INFO@EPSOMCOLLEGE.ORG.UK](mailto:INFO@EPSOMCOLLEGE.ORG.UK) [EPSOMCOLLEGE.ORG.UK](http://EPSOMCOLLEGE.ORG.UK)

## Questions

**Q1.**

The diagram shows a cuboid.

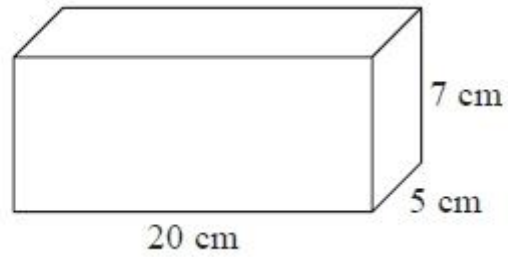


Diagram **NOT**  
accurately drawn

Work out the volume of the cuboid.

.....  
(Total for Question is 1 marks)

**Q2.**

(a) Work out  $2\frac{1}{5} - 1\frac{4}{7}$

.....  
(2)

(b) Work out  $1\frac{2}{3} \div \frac{3}{4}$

.....  
(2)

(Total for question = 4 marks)

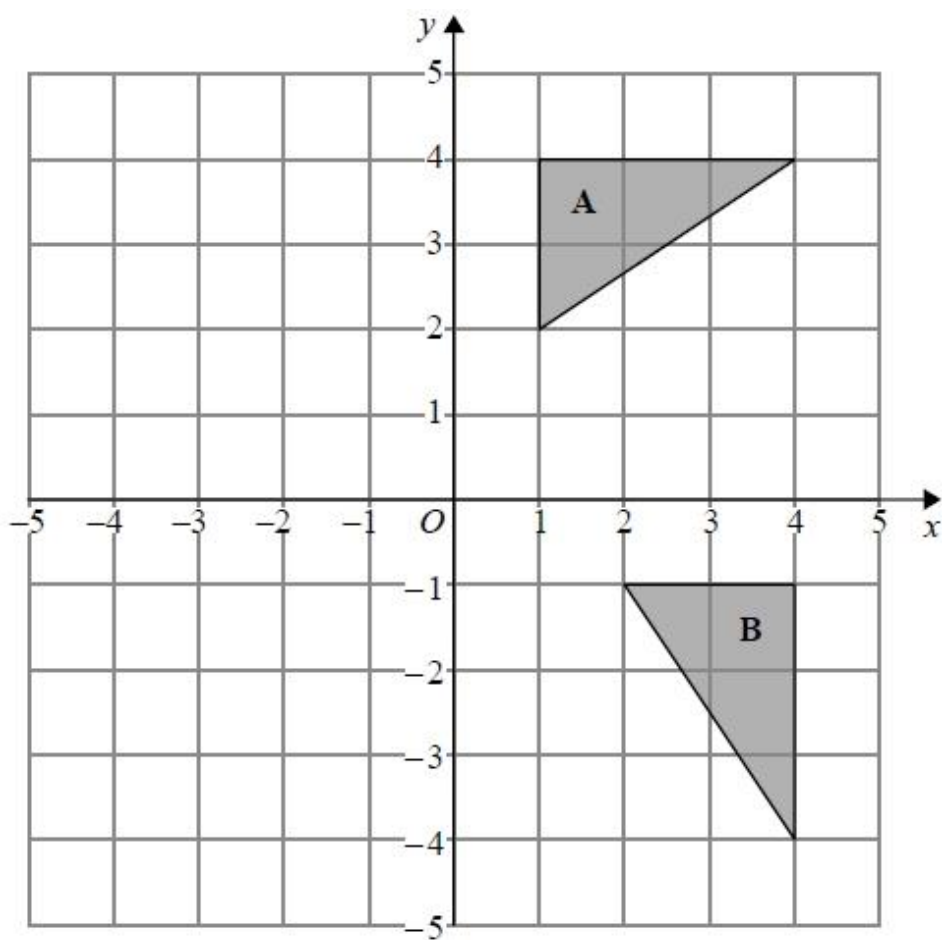
**Q3.**

(a) Solve  $5(x + 3) = 2x + 57$

(2)

(Total for question = 2 marks)

**Q4.**



Describe fully the single transformation that maps triangle **A** onto triangle **B**.

.....  
.....

(Total for question = 2 marks)

**Q5.**

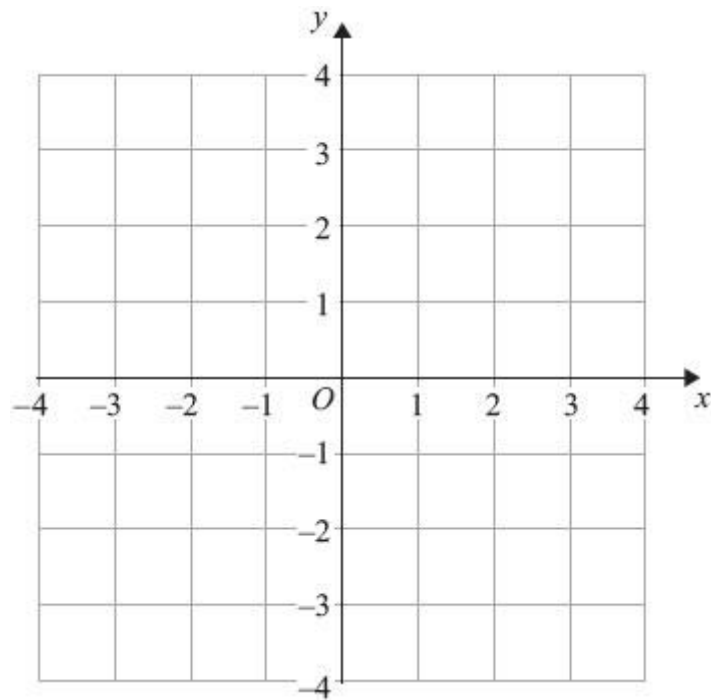
Given that  $A = 2^4 \times 3^3 \times 5$  and  $B = 2^3 \times 3 \times 5^2$   
write down, as a product of powers of its prime factors,

(i) the highest common factor (HCF) of  $A$  and  $B$

(ii) the lowest common multiple (LCM) of  $A$  and  $B$ .

**(Total for question = 2 marks)**

**Q6.**



(a) On the grid above, draw the line  $x = 3$

(1)

(b) On this grid, draw the line  $y = x$

(1)

(c) Find the point of intersection between the lines  $x = 3$  and  $y = x$

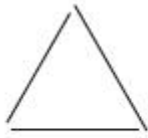
Point of intersection = (.....,.....)

(1)

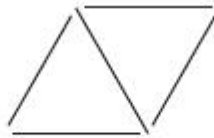
**(Total for Question is 3 marks)**

**Q7.**

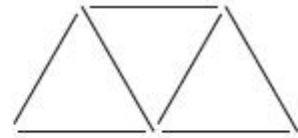
Here are some patterns made from sticks.



Pattern number 1



Pattern number 2



Pattern number 3

(a) In the space below, draw Pattern number 4

(1)

(b) Complete the table.

Pattern number	1	2	3	4	5
Number of sticks	3	5	7		

(1)

Maria wants to work out how many sticks make Pattern number 50

(c) Write down a method she can use.

.....  
.....  
.....

(1)

**(Total for Question is 3 marks)**

**Q8.**

The diagram shows a semicircle drawn inside a rectangle.

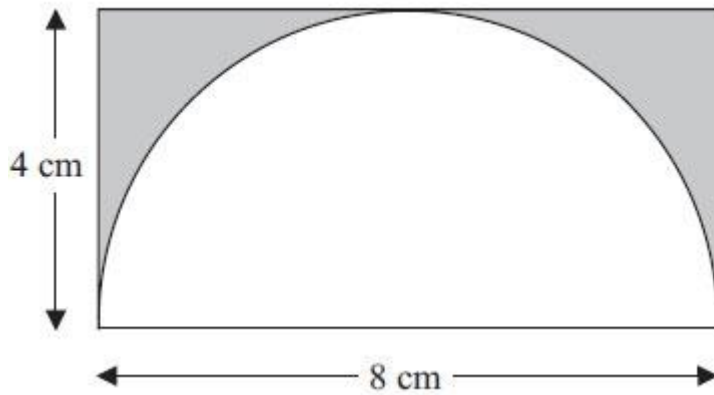


Diagram **NOT**  
accurately drawn

The semicircle has a diameter of 8 cm.  
The rectangle is 8 cm by 4 cm.

Work out the area of the shaded region. Use  $\pi = 3$  in your calculations.

..... cm<sup>2</sup>

**(Total for Question is 4 marks)**

**Q9.**

(a) Expand  $5(m + 2)$

..... (1)

(b) Factorise  $y^2 + 3y$

..... (1)

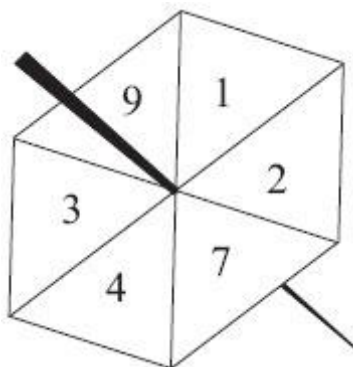
(c) Simplify  $a^5 \times a^4$

..... (1)

**(Total for Question is 3 marks)**

**Q10.**

Here is a fair 6-sided spinner.



Jake is going to spin the spinner once.

(a) Write down the probability that the spinner will land  
(i) on 4

.....

(ii) on a number greater than 10

.....

(2)

Liz is going to spin the spinner 120 times.

(b) Work out an estimate for the number of times the spinner will land on 7

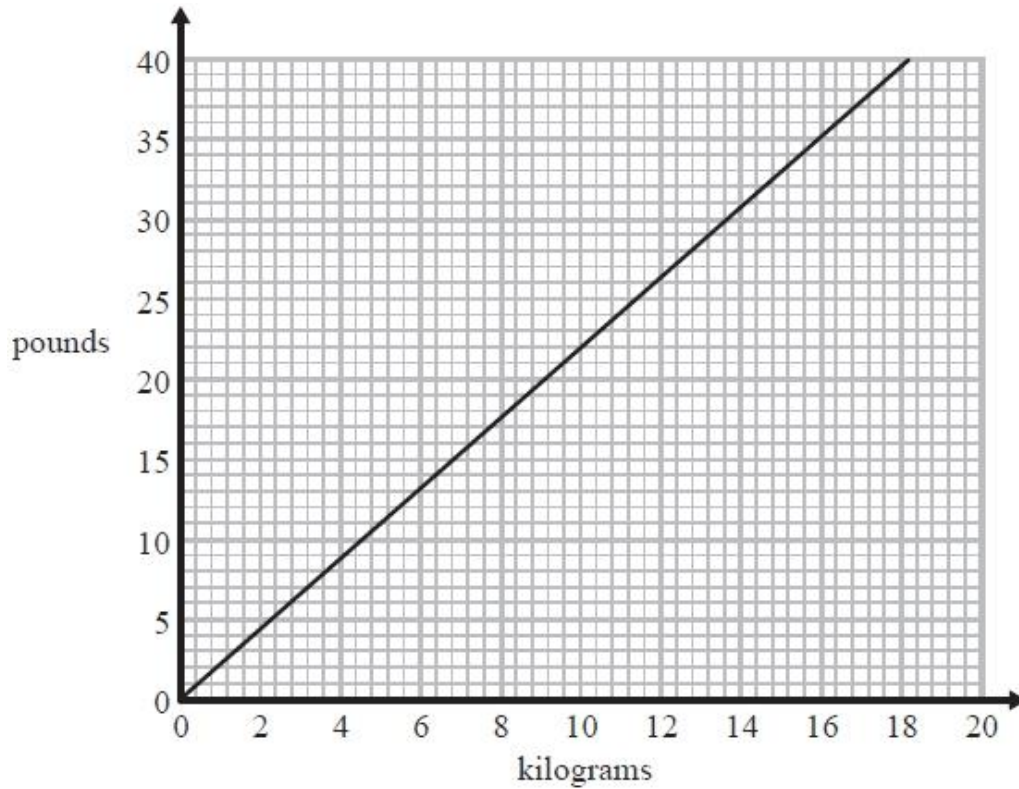
.....

(1)

**(Total for Question is 3 mark)**

**Q11.**

You can use this graph to change between pounds and kilograms.



(a) Change 13 pounds to kilograms.

..... kilograms  
(1)

A trolley can carry a maximum weight of 200 pounds.

Jack has 4 bags of potatoes.

Each bag of potatoes weighs 25 kilograms.

\*(b) Can the trolley carry the 4 bags of potatoes at the same time?  
You must show your working.

(2)  
(Total for question = 3 marks)



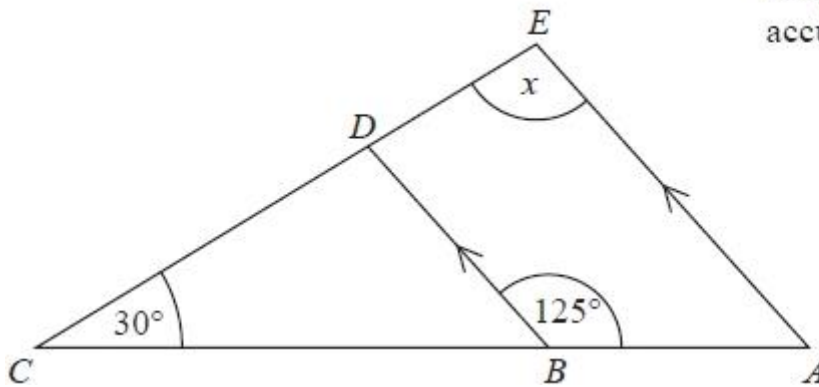
**Q12.**

Expand and simplify  $(m + 7)(m + 3)$

.....  
**(Total for question = 2 marks)**

**Q13.**

Diagram **NOT**  
accurately drawn



$ABC$  and  $EDC$  are straight lines.

$AE$  and  $BD$  are parallel.

Angle  $ABD = 125^\circ$

Angle  $BCD = 30^\circ$

Work out the size of the angle marked  $x$ .

Give reasons for your answer.

**(Total for question = 3 marks)**

**Q14.**

The diagram shows the floor plan of Mary's conservatory.

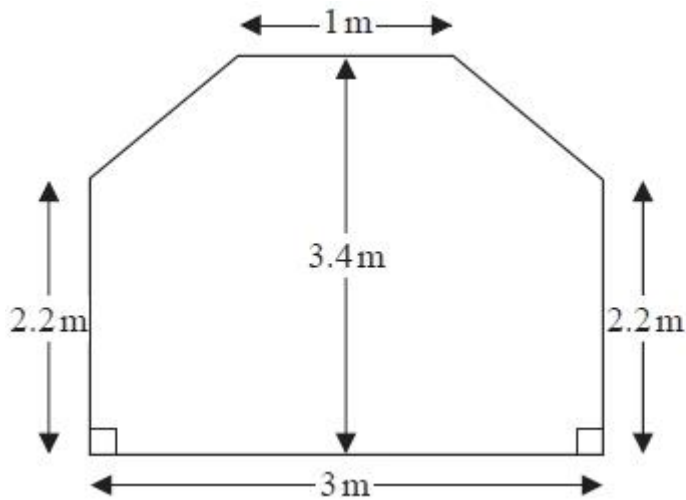


Diagram **NOT**  
accurately drawn

Mary is going to cover the floor with tiles.

Note: - Area of a Trapezium =  $\frac{(a+b)}{2} \times h$

The tiles are sold in packs.

One pack of tiles will cover  $2\text{m}^2$

A pack of tiles normally costs £24.80

Mary gets a discount of 25% off the cost of the tiles.

Mary has £100

Does Mary have enough money to buy all the tiles she needs?

You must show all your working.

**(Total for question = 4 marks)**

**Q15.**

The diagram shows **shape A**.  
All the measurements are in centimetres.

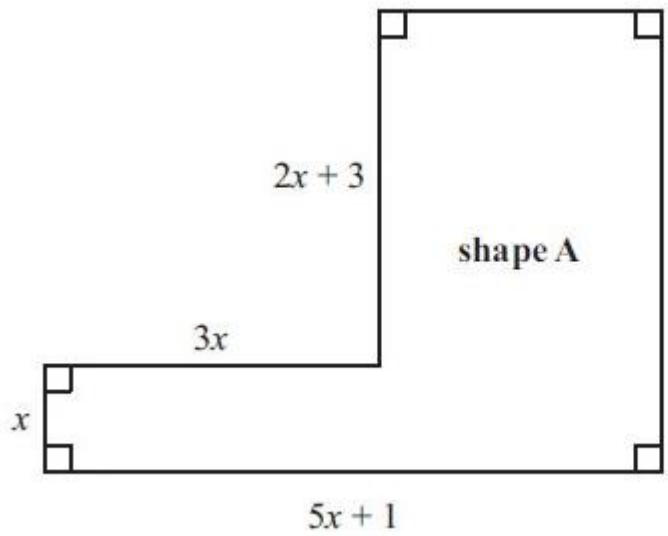


Diagram **NOT**  
accurately drawn

(a) Find an expression, in terms of  $x$ , for the perimeter of **shape A**.

.....  
(2)

A square has the same perimeter as **shape A**.

(b) Find an expression, in terms of  $x$ , for the length of one side of this square.

.....  
(1)

**(Total for Question is 3 marks)**

**Q16.**

Dimitar has 20 sweets.

Pip also has 20 sweets.

Dimitar gives Pip 2x sweets.

Dimitar then eats 5 of his sweets.

Pip then eats half of her sweets.

Write simplified expressions for the number of sweets Dimitar and Pip now have.

Dimitar .....

Pip .....

**(Total for question = 3 marks)**

**END OF TEST**