Problem Solving GCSE Questions 3

(1) John wants to buy his wife some roses for Valentines Day. They have been together 22 years and John wants to buy 22 roses to celebrate.
John has the option of buying the roses from the two companies shown below.

Roses R Us
Roses £1.30 each
10% for
orders over £10

Roses.com
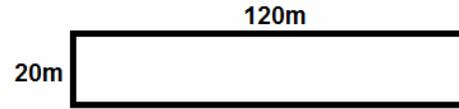
£8.80 for a pack
of 8 roses

Advise John which company to use if he wants to get 22 roses as cheaply as possible. He can only use one company for his purchase.

(2) In a school the ratio of boys to girls is 1:3.
A number of boys leave the school such that the ratio of boys to girls is now 1:4.
By how much did the percentage of girls increase in the school after the boys left?

(3) Sybil owns a rectangular piece of land as shown in the diagram below.

120m

20m

- Sybil needs to section off 400m² for her sheep.
- Sybil needs at least 20% of the total land to grow crops on.
- Of the remaining land Sybil wants to divide it into two equally sized pieces to grow a range of crops.

Using the templates below, show how Sybil can do this. You must show the dimensions of each piece of land clearly.
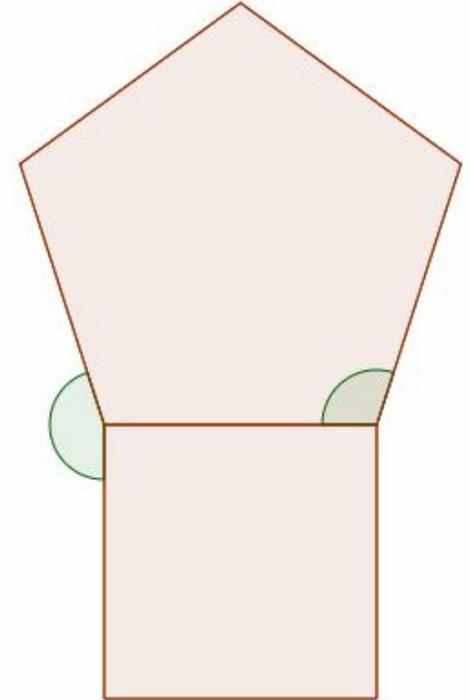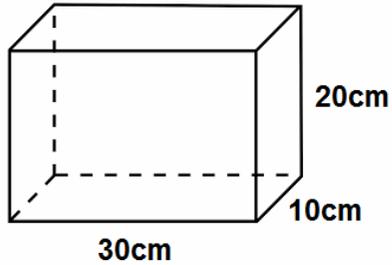
Practice

Answer

(4) The diagram below shows a square attached to the base of a regular pentagon. The side lengths of the square and the pentagon are equal.

Find the ratio of the size of the larger angle to the size of the smaller angle shown in the diagram. You must give your answer in its simplest form.

(5) Helen is packing Prongles Crisps into the box below. The carton for the crisps is in the shape of a cylinder with a radius of 2.5cm and a height of 4cm.

20cm
10cm
30cm

Find the minimum amount of space that is wasted if she puts the maximum number of cartons in the box.

(6) The points $A(3,8)$, $B(a,35)$, $C(21,b)$ and $D(c,d)$ all lie on the same straight line.
Given that $AB = BC = CD$, find the values of a, b, c and d.

(7) Below are two tables showing some information about the scores obtained by boys and girls sitting the same exam. The exam was out of 100.

Boys	
Lowest Score	12
Lower Quartile	20
Median	48
Upper Quartile	
Highest Score	

Girls	
Lowest Score	
Lower Quartile	25
Median	
Upper Quartile	48
Highest Score	64

Here are some facts about the results:
1. The Boys IQR was double the girls
2. The difference between the medians was 6.
3. The highest scoring boy scored 7 times more than the lowest scoring boy.
4. The range of the girls scores was two thirds of the range of the boys scores.

Using this information, complete the two tables.

(8) Given that the area of the rectangle and the square below are the same, find the difference in the perimeters of the two shapes.

$p+6$
$p+1$
$p+3$