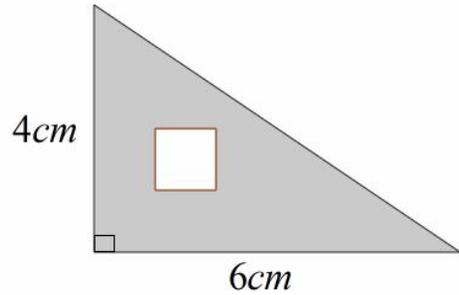


**Problem Solving GCSE Questions 8**

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(1) The diagram below shows a triangle with a square inside.



Given that the area of the square is one twelfth the area of the triangle, find the perimeter of the square.

(2) Given that:

$$\frac{2}{3} + \frac{a}{b} + \frac{1}{12} = \frac{9}{4}$$

Without a calculator, find the value of  $a^b$ .

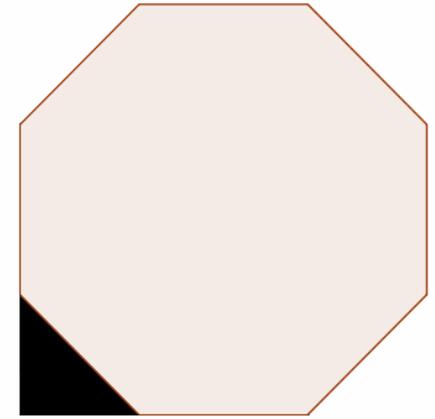
(3) Janet saves some money in an account at her bank. They offer her two different plans.

**Plan 1**  
**5% Compound interest each year.**

**Plan 2**  
**6% Simple interest each year.**

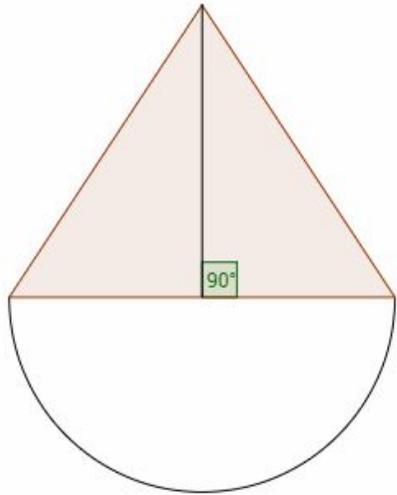
Janet decides to invest £520 for 7 years.  
Advise Janet on which plan she should take.  
You must show clear workings.

(4) The diagram below shows a regular octagon with a right angled triangle attached to it.



Given that the perimeter of the octagon is 56cm, find the area of the triangle.

(5) The diagram below shows a triangle with a semicircle attached to the bottom.



Given that the area of the triangle is  $6\text{cm}^2$  and it has a height of  $3\text{cm}$ , find the perimeter of the semicircle. Give your answer correct to 2 decimal places.

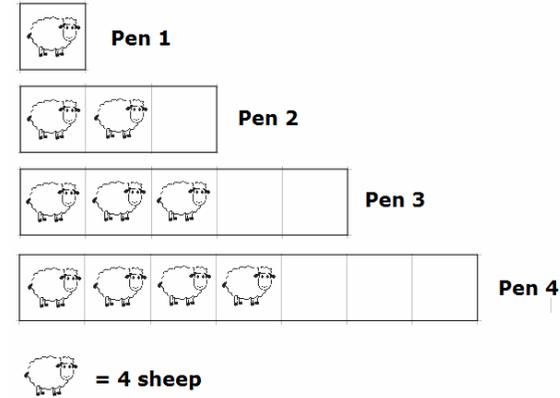
(6) The table below shows the distances (in miles) between a number of different towns.

	A	B	C	D	E	F
A	-	10	13	12	15	20
B	10	-	8	7	11	5
C	13	8	-	6	9	14
D	12	7	6	-	18	2
E	15	11	9	18	-	3
F	20	5	14	2	3	-

Bob drives from Town A to Town E via Town D. He spends a total of 45 minutes driving to complete the journey. Jane travels directly between two of the towns at exactly the same average speed as Bob. Given that Jane's journey took seven and a half minutes, find which two towns she drove between.

(7)  $a, b$  and  $c$  are the only three values of a data set where  $a < b < c$ . The data set has a range of 12 and the median value is 4. Given that  $b - a = c - b$ , find the values of  $a, b$  and  $c$ .

(8) Farmer Fred has 320 sheep pens. The first 4 sheep pens are shown below.



Pen 1 has 1 square meter of land and has 4 sheep in it. Pen 2 has 3 square meters of land and has 8 sheep in it. This pattern continues up until the 320<sup>th</sup> pen. The area of the 320<sup>th</sup> pen is divided equally between the sheep in the pen. How much space does each sheep in the 320<sup>th</sup> pen have? Give your answer to 3 significant figures.