

Non-Routine Questions 2

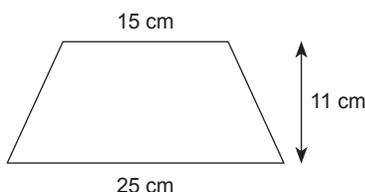
NOTES

Heuristics: Simplify the Problem

One of the commonly used heuristics in mathematics problem solving is simplification of the problem. To simplify a problem is to break it down to two or more smaller parts. This makes it more manageable. Students can then solve them in parts to get the final answer. Although this takes time, it helps us to see the problem differently and solve it with ease.

Let's see how we can solve the following mathematical problem by simplifying the problem.

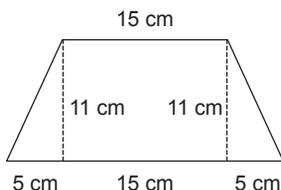
The figure below shows a trapezium. Find the area of this figure.



First step: Look at the trapezium. It can be divided into two identical triangles and a rectangle.



Second step: Find the dimensions of the figure.

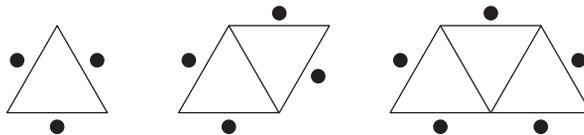


Third step: To find the area of the figure, add the areas of the two triangles and rectangle together.

Do these questions on another piece of paper.

1. Alan, Betsy and Christine have some money. The amount of money that Alan and Betsy have is \$85. The amount of money that Betsy and Christine have is \$100. The amount of money that Christine and Alan have is \$81. How much does each of them have?
2. 10 people can sit around a rectangular table for a meal. When two such tables are joined side by side, 18 people can sit around the two tables. When three such tables are joined side by side, 26 people can sit around the three tables. How many such rectangular tables are needed for 90 people to sit around?
3. I am a 2-digit number. My first digit is 1.5 times more than the second digit. Both the digits are factors of 24. The sum of both digits is an even number. What am I?
4. In a group, some children like swimming while others like skiing or both sports. 25 children like swimming and 21 children like skiing. Of these, 13 like both swimming and skiing. How many children are there in the group?
5. The sum of number A and number B is 29. Their product is 210. Find the two numbers.
6. In recent years, the number of tourists visiting Egypt tripled every half a year. If there were 4455 tourists visiting Egypt in December 2012, find the number of tourists who visited Egypt in June 2011.

7.



3 people can sit around a triangular table. 4 people can sit around two such tables. 5 people can sit around three such tables. How many people can sit around 100 such tables?

8. I am a 4-digit number.
- The sum of all my digits is 10.
 - The sum of my first and third digits is equal to my last digit.
 - My third digit is 60% of my last digit.
- What am I?
9. Grace, Jessie and Zoe have some stamps. The total number of Grace's stamps and Zoe's stamps is 219. The total number of Jessie's stamps and Zoe's stamps is 266. The total number of Grace's stamps and Jessie's stamps is 297. Find the number of stamps each girl has.
10. At a tuition centre, some teachers teach English while others teach Mathematics or both subjects. 52 teachers teach English and 38 teachers teach Mathematics. Of these, 22 teachers teach both subjects. How many teachers are there in the tuition centre?
11. The value of a flat is fourfold every 10 years. If the flat had a value of \$8590 in 1970, in which year did the flat have a value of \$137 440?
12. The sum of Simon's age and George's age is 36. The product of their age is 320. Find the difference between their ages.