



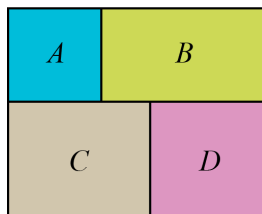
Problem of the Week

Problem A and Solution

Quilting Puzzle

Problem

The employees of Sew Inspired need to make a tiny quilt for a special project using four different colours of fabric. Their quilt pattern is a rectangle divided into four smaller rectangles, marked A , B , C , and D .



Piece A is a square with area 16 cm^2 and piece D is a square with area 25 cm^2 . The horizontal distance between the right side of piece A and the left side of piece D is 2 cm. What is the area of the entire quilt?

Solution

To calculate the area of the quilt we will determine the lengths of its sides. We know that piece A is a square with area 16 cm^2 . We also know that the lengths of the sides of a square must be the same. So if the length of one side of a square is n , then the area of the square must be $n \times n$. By trial and error, we determine $4 \times 4 = 16$, and so the length of each side of piece A must be 4 cm. Another way to determine the lengths of the sides of piece A is to start with 16 unit squares (using blocks or cut out of paper) and determine how to arrange them into a larger square. The only possible arrangement is a 4×4 square.

Similarly, piece D is a square with area 25 cm^2 . Since $5 \times 5 = 25$, the length of each side of piece D must be 5 cm.

The opposite sides of a rectangle must be the same length, so the width of the quilt (i.e. the vertical side) is equal to the sum of the side lengths of pieces A and D . Thus, the width of the quilt is equal to $4 + 5 = 9$ cm. Similarly, we know the bottom of piece A is on the same line as the top of piece D , and the horizontal distance between the two pieces is 2 cm. Therefore the length of the quilt (i.e. the horizontal side) is equal to the sum of the side lengths of pieces A and D , plus 2. Thus, the length of the quilt is equal to $4 + 5 + 2 = 11$ cm.

Now we can calculate the area of the entire quilt. The area of this rectangle is the product of its length and width. So the area of the entire quilt is $9 \times 11 = 99 \text{ cm}^2$.