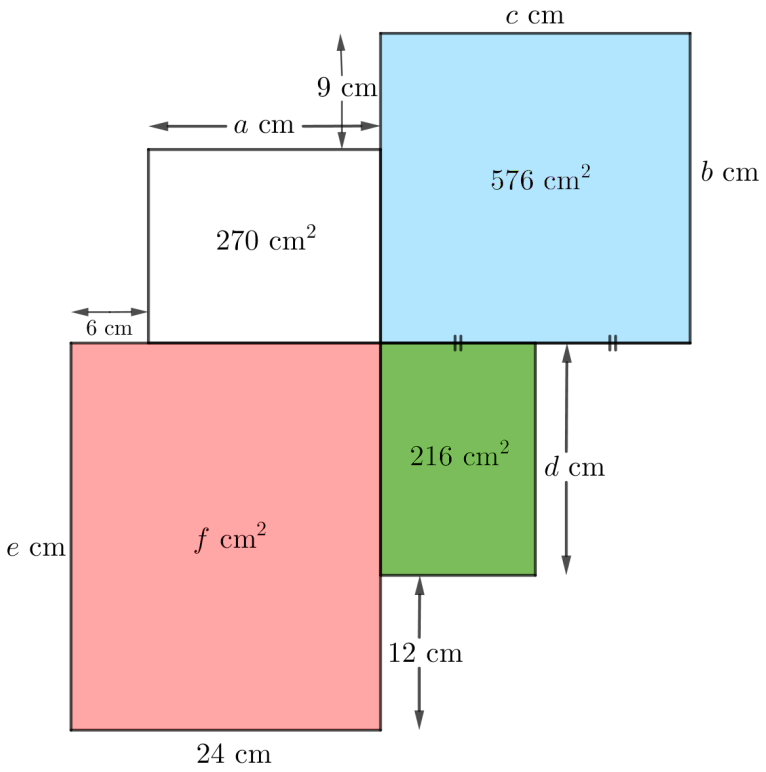
Problem of the Week
Problem B and Solution
Puzzling Areas

Problem

Four rectangles meet at a common vertex, as shown in the diagram.



Determine the values of a, b, c, d, e, and f.

Solution

We will call the top left rectangle A, the top right rectangle B, the bottom right rectangle C, and the bottom left rectangle D.

Since the length of the bottom side of D is 24 cm, the length of the top side of D is also 24 cm. Hence, the length of the bottom side of A is $24 - 6 = 18$ cm. Therefore, the length of the top side of A is 18 cm and so $a = 18$.

Since the area of A is 270 cm^2 and the length of the bottom side of A is 18 cm, then the length of the right side of A is $270 \div 18 = 15$ cm. Therefore, $b = 9 + 15 = 24$.

Since the area of B is 576 cm^2 and $b = 24$, then $c = 576 \div 24 = 24$.

Since the length of the top side of B is 24 cm, then the length of the bottom side is also 24 cm. Thus, the length of the top side of C is half of 24 cm or 12 cm. Since the area of C is 216 cm^2, then $d = 216 \div 12 = 18$.

Thus, $e = d + 12 = 18 + 12 = 30$.

Finally, the area of D is equal to $24 \times e = 24(30) = 720$ cm^2 and so $f = 720$.

Note: this puzzle is adapted from *"Area Mazes"* by Naoki Inaba.