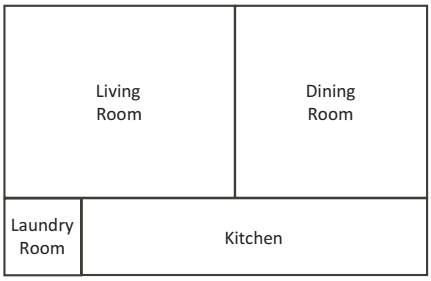
Problem of the Week
Problem C and Solution
Floor Plan

Problem

The rectangular floor plan of the first level of a house is shown in the following diagram. Both the laundry room and the dining room are square with areas of 4 m^2 and 25 m^2, respectively. The living room is rectangular with an area of 30 m^2. Determine the area of the kitchen.



Solution

Let the width of a room be the distance represented top to bottom on the diagram. Let the length of a room be the distance represented horizontally on the diagram.

The dining room is a square and has an area of 25 m^2. Its length and width must both be 5 m since Area $= 5 \times 5 = 25$ m^2. The width of the dining room and living room are the same. So the width of the living room is 5 m. But the area of the living room is 30 m^2 so the length of the living room is 6 m since Area $= 5 \times 6 = 30$ m^2.

The laundry room is a square and has an area of 4 m^2. Its length and width must both be 2 m since Area $= 2 \times 2 = 4$ m^2. The width of the laundry room and kitchen are the same. So the width of the kitchen is 2 m.

$$\begin{aligned} (\text{Length of Laundry Room} & & (\text{Length of Living Room} \\ + \ \text{Length of Kitchen}) & = & + \ \text{Length of Dining Room}) \\ 2 + \text{Length of Kitchen} & = & 6 + 5 \\ \text{Length of Kitchen} & = & 9 \text{ m} \end{aligned}$$

Since the width of the kitchen is 2 m and the length of the kitchen is 9 m, the area of the kitchen is $2 \times 9 = 18$ m^2.