Problem of the Week
## Problem C and Solution
Teddy Was Framed

Problem

Pat has four rectangular pieces of wood, each 30 cm long and 3 cm wide. She arranges the four pieces of wood to form the border of a picture frame for a picture of a teddy bear, as shown.

Determine the area of the region enclosed by the wooden frame.
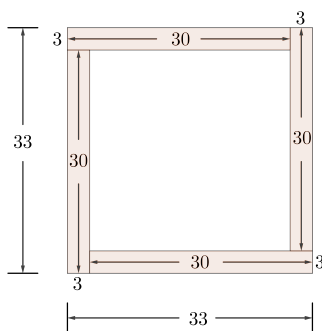
Solution

Solution 1

The region enclosed by the wooden frame is a square with side length $30 - 3 = 27$ cm.
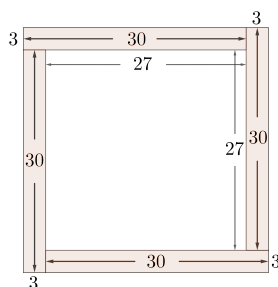
Thus, the area of the region enclosed by the frame is equal to $27 \times 27 = 729$ cm^2.

Solution 2

The outer perimeter of the frame forms a square with side length $30 + 3 = 33$ cm.

The area of the outer square is therefore $33 \times 33 = 1089$ cm^2.

The area of the region enclosed by the wooden frame is equal to the area of the outer square minus the areas of the four wooden rectangles.

Each wooden rectangle has area $30 \times 3 = 90$ cm^2.

Therefore, the area of the region enclosed by the frame is equal to $1089 - 4 \times 90 = 729$ cm^2.