



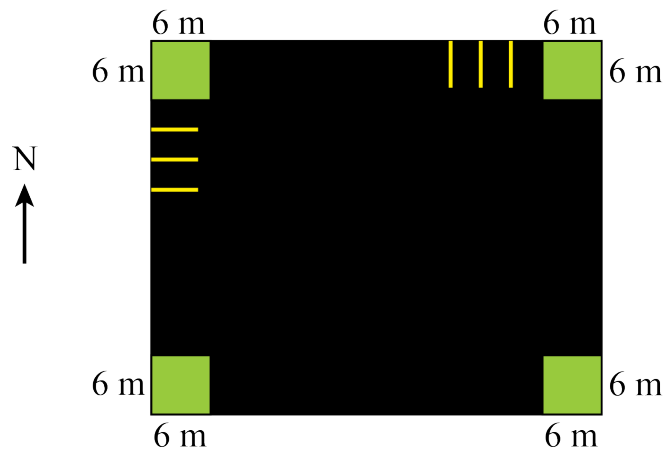
Problem of the Week

Problem B and Solution

Parking by Design

Problem

KalMart has a paved, rectangular parking lot with a 6 m by 6 m curbed garden in each corner. There are parking spots along the north and west sides of the parking lot. Some of the parking spots on the north and west sides are shown in the diagram.



Each parking spot is 2.5 m wide, and the lines separating the parking spots are 7.5 cm thick.

- There are 25 parking spots along the north side of the parking lot. What is the length, in metres, of the north side of the parking lot, including the gardens?
- There are 20 parking spots along the west side of the parking lot. What is the length, in metres, of the west side of the parking lot, including the gardens?
- What is the total area, in square metres, of the paved portion of the parking lot, excluding the gardens?

Solution

- There are 25 parking spots on the north side, plus 24 lines between them, since there are no lines at the corners next to the gardens. Since each parking spot is 2.5 m wide, the parking spots occupy a total of $25 \times 2.5 = 62.5$ m. Since each line is $7.5 \text{ cm} = 0.075$ m thick, the lines occupy a total of $24 \times 0.075 = 1.8$ m. The corner gardens occupy a total of $2 \times 6 = 12$ m. Thus, the total length of the north side is $62.5 + 1.8 + 12 = 76.3$ m.
- Similarly, there are 20 parking spots on the west side, plus 19 lines between them. Since each parking spot is 2.5 m wide, the parking spots occupy a



total of $20 \times 2.5 = 50$ m. Since each line is $7.5 \text{ cm} = 0.075$ m thick, the lines occupy a total of $19 \times 0.075 = 1.425$ m. The corner gardens occupy a total of $2 \times 6 = 12$ m. Thus, the total length of the west side is $50 + 1.425 + 12 = 63.425$ m.

- (c) The total area of the parking lot is $76.3 \times 63.425 = 4839.3275 \text{ m}^2$. Each corner garden has an area of $6 \times 6 = 36 \text{ m}^2$. The total garden area is then $4 \times 36 = 144 \text{ m}^2$. Thus, excluding the four gardens, the area of the paved portion of the lot is $4839.3275 - 144 = 4695.3275 \text{ m}^2$.