Problem of the Week
Problem B and Solution
Redecoration Station

Problem
Nimrat wants to redecorate her bedroom. The floor plan for her bedroom is shown below.

![Floor Plan](image)

The walls in Nimrat’s bedroom are 2.5 m high.

(a) Nimrat wants nice, plush, wall-to-wall carpet in her bedroom. How many square metres of carpet will she need to buy? If the carpet she buys costs $20 per square metre, how much will her carpet cost in total?

(b) Wallpaper costs $8 per square metre. How much wallpaper will she need to cover the north and east walls? How much will it cost for the wallpaper for those two walls?

(c) She decides to paint the south and west walls, and the cost for paint to do so is $75. If her total budget is $500 for carpet, wallpaper, and paint, how much over or under her budget is she?

Solution

(a) Since the total floor area of Nimrat’s bedroom is $4 \times 3 = 12 \text{ m}^2$, and the carpet costs $20$ per square metre, the cost of her wall-to-wall carpet will be $20 \times 12 = 240$.

(b) Since the north wall is 4 m long and 2.5 m high, its area is $4 \times 2.5 = 10 \text{ m}^2$. Since the east wall is 3 m long and 2.5 m high, its area is $3 \times 2.5 = 7.5 \text{ m}^2$. Thus, the total area to be wallpapered is $10 + 7.5 = 17.5 \text{ m}^2$. Therefore, the cost of the wallpaper at $8$ per square metre will be $17.5 \times 8 = 140$.

(c) The total cost of wallpaper, carpet, and paint will be $240 + 140 + 75 = 455$. Since her total budget is $500, she will be $500 - 455 = 45$ under her budget.