

5. Geometry and Measures

Planning and budgeting for a home renovation

Your family has recently moved into a house that needs renovating. Your parents have asked you to help them budget and plan the renovation by working out how much of each material is needed.

Below you will find all the information you need to plan and budget for your renovation. The table below is the renovation plan, you will find blueprints on page 4 and a material pricing list on page 5.

Renovation Plan	
Room	Renovation
Kitchen/Dining Room	Wallpaper on all walls Retiling the floor
Living Room	Wallpaper on the two smallest walls Recarpet the floor
Bedroom 1	Paint all the walls Recarpet the floor
En Suite	Paint all the walls Retiling the floor
Bedroom 2	Wallpaper on all walls Recarpet the floor
Family Bathroom	Paint all the walls Retiling the floor

1. How many rolls of wallpaper do you need to renovate the **Kitchen/Dining room**?

$$(3 \times 3) + (3.6 \times 3) + (6 \times 3) + (2.4 \times 3) - (0.8 \times 2.4) - (0.65 \times 0.9) = 42.5\text{m}^2$$
$$42.5 / 5 = 8.5 = 9 \text{ rolls}$$

2. How much would recarpeting the **Living Room** and **Bedroom 2** cost?

Bedroom 2: $3 \times 2.6 = 7.8\text{m}^2$
Living Room: $6 \times 2.8 = 16.8\text{m}^2$
Total = 24.6m^2
 $\pounds 11.50 \times 25 = \pounds 287.5$

3. How many pots of paint do you need to paint the walls of **Bedroom 1** and the **Family Bathroom**?

Family Bathroom: $(1 \times 3 \times 2) + (2.6 \times 2 \times 3) - (0.8 \times 2.4) = 19.68\text{m}^2$
Bedroom 1: $(4 \times 3 \times 2) + (3.2 \times 3 \times 2) - (2 \times 0.8 \times 2.4) - (0.65 \times 0.9) = 38.76\text{m}^2$
Total wall area to be painted = 58.44m^2

Paint covers $7\text{m}^2 / \text{L}$ and is sold in 10L pots
 $58.44 / 7 = 8.35\text{L}$

1 10L pot will be enough to paint both rooms

4. Calculate how many tiles your family would need if they retiled the **En Suite** and the **Family Bathroom** floors.

Floor for each bathroom: $(2.6 \times 1) = 2.6\text{m}^2$
Total floor area = 5.2m^2

Each tile is 0.6×0.6
Tiles: $5.2 / 0.6 = 8.6 = 9$ tiles

5. How much would renovating **Bedroom 1** (painting all walls and recarpeting the floor) and the **En Suite** (painting all walls and retiling the floor cost)?

Bedroom 1: $(4 \times 3 \times 2) + (3.2 \times 3 \times 2) - (2 \times 0.8 \times 2.4) - (0.65 \times 0.9) = 38.76\text{m}^2$ (from previous question)

Paint: $38.76 / 7 = 5.5\text{L}$

Floor: $(3 \times 3.2) + (0.6 \times 1) = 10.2\text{m}^2$

Carpet: $\pounds 11.50 \times 11 = \pounds 126.50$ (minimum 1m^2 units)

En Suite:

Walls: $(2.6 \times 3 \times 2) + (1 \times 3 \times 2) = 21.6\text{m}^2$

Paint: $21.6 / 7 = 3.1\text{L}$

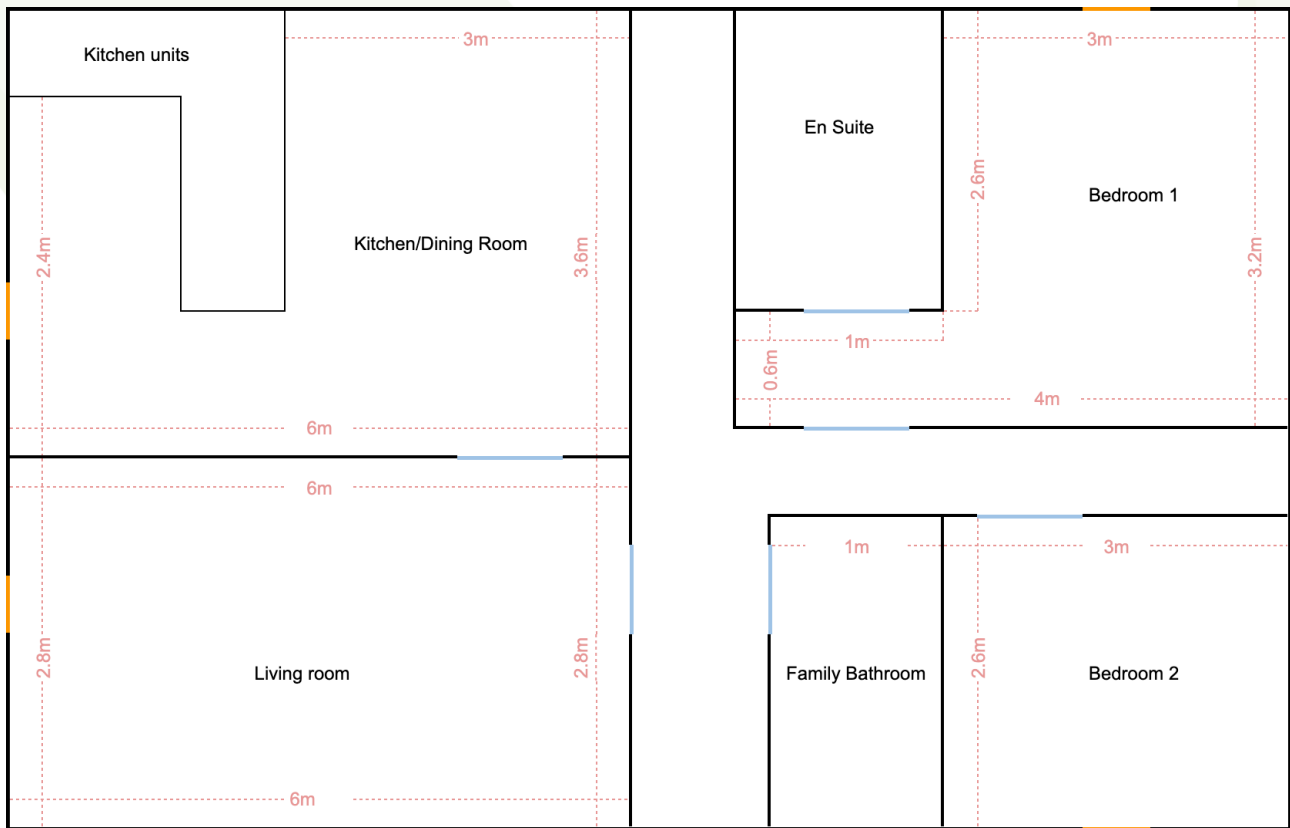
$5.5\text{L} + 3.1\text{L} = 8.6\text{L} = \pounds 44$ (1 pot can cover both rooms)

Floor: $(2.6 \times 1) = 2.6\text{m}^2$

Tiles: $2.6 / 0.6 = 4.3 = 5$ tiles $\times \pounds 7 = \pounds 35$

Total cost: $\pounds 44 + \pounds 126.50 + \pounds 35 = \pounds 205.50$

House blueprints



Key:

Doors: 

Windows: 

All walls are 3m tall.

Doors: 0.8m x 2.4m

Windows: 65cm x 90cm

Price list

Wallpaper

1 roll (covers 5m ²)	£12
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Paint

10L pot (covers up to 7m ² /L)	£44
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Bathroom floor tiles

£7 per tile

Each tile is 60cm x 60cm

Kitchen floor tiles

£6 per tile

Each tile is 60cm x 60cm

Carpet

Per m ²	£11.50
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