

## 28. Geometry and Measures

Studying floor plans to find a flat that offers good value for money.

Amanda is looking for a new flat to rent after her current lease expires. She has narrowed down her options to two flats that are both in convenient parts of town. As such, she is basing her decision on factors such as total size, value for money, her ability to bring her existing furniture with her, and whether she can redecorate the flat to her taste.

1. Review the floor plans and work out which flat is larger in  $m^2$ .

### Flat 1:

$$\text{Kitchen/ Living Room } (5.05 \times 5.9) - (2.5 \times (3.8 - 3.05)) = 27.88$$

$$\text{Hall } (2.5 \times 3.05) = 7.63$$

$$\text{Kitchen } (2.55 \times 3.8) = 9.69$$

$$\text{Bedroom } (4.68 \times 3.95) = 18.49$$

$$\text{Bathroom } (2.55 \times 3.95) = 10.07$$

$$\text{Total area} = 73.76m^2$$

### Flat 2:

$$\text{Bedroom } (2.6 \times 5.7) + (3.1 \times (5.98 + 2.6 + 2.6 - 5.78 - 2.6 - 2.6)) = 15.44$$

$$\text{Hall } (2.6 \times 2.6) = 6.76$$

$$\text{Bathroom } (3.1 \times 2.6) = 8.06$$

$$\text{Living Room } (5.98 \times 3.2) = 19.14$$

$$\text{Kitchen } (3.1 \times 5.78) = 17.92$$

$$\text{Total area} = 67.31m^2$$

Flat 1 is larger.

2. The rent is advertised for Flat 1 as £1,400 per month and for Flat 2 as £1,700 per month. However, after speaking to the current residents of each flat, Amanda finds out that they are currently paying £1,250 per month for Flat 1 and £1,500 per month for Flat 2. What percentage has each landlord increased rent by from the levels that current residents are paying?

Percentage change = (new amount - original amount) ÷ original amount

Flat 1:  $(1,400 - 1,250) \div 1,250 = 12\%$

Flat 2:  $(1,700 - 1,500) \div 1,500 = 13\%$

3. What was the rent increase for each flat per m<sup>2</sup>?

**Flat 1:**

Total area = 73.67m<sup>2</sup>

Previous price per m<sup>2</sup> =  $1250 \div 73.76 = \text{£}16.95$

Current price per m<sup>2</sup> =  $1400 \div 73.76 = \text{£}18.98$

Price change =  $\text{£}16.95 - \text{£}18.98 = \text{£}2.03$

**Flat 2:**

Total area = 67.31m<sup>2</sup>

Previous price per m<sup>2</sup> =  $1500 \div 67.31 = \text{£}22.28$

Current price per m<sup>2</sup> =  $1700 \div 67.31 = \text{£}25.26$

Price change =  $\text{£}22.28 - \text{£}25.25 = \text{£}2.98$

4. Based on your own review of the floor plans, what are some qualitative factors that you believe Amanda should consider when comparing the size of each flat?

Amanda may want to consider the size of the individual rooms. For instance, she might want a larger living space to entertain friends and family or a larger bedroom to accommodate a workspace. Amanda may also want to consider factors such as the local area, whether the flats have a view, and what floor she is on.

5. Amanda decides that Flat 1 is not decorated to her taste. Her landlord agrees that Amanda can repaint the flat as she wishes in exchange for a discount on her first month of rent. Assuming that the ceiling height is 2.6m and that 1L of paint covers  $6\text{m}^2$ , use the floor plans to calculate how much paint will Amanda need to use to redecorate the living room and bedroom?

$$(5.05 \times 2.6 \times 2) + (5.9 \times 2.6 \times 2) + (4.68 \times 2.6 \times 2) + (3.95 \times 2.6 \times 2) = 101.816\text{m}^2$$

$$101.816\text{m}^2 \div 6 = 16.97\text{L} = 17\text{L of paint}$$

6. Amanda has furniture from her current flat that she plans to bring with her but she is not sure whether it will fit in either Flat 1 or Flat 2. Below are the measurements for her bedroom furniture set:

Bed 135 x 190 cm

Wardrobe: 117 x 190cm

Chest of drawers: 70 x 83cm

Desk: 105 x 60 cm

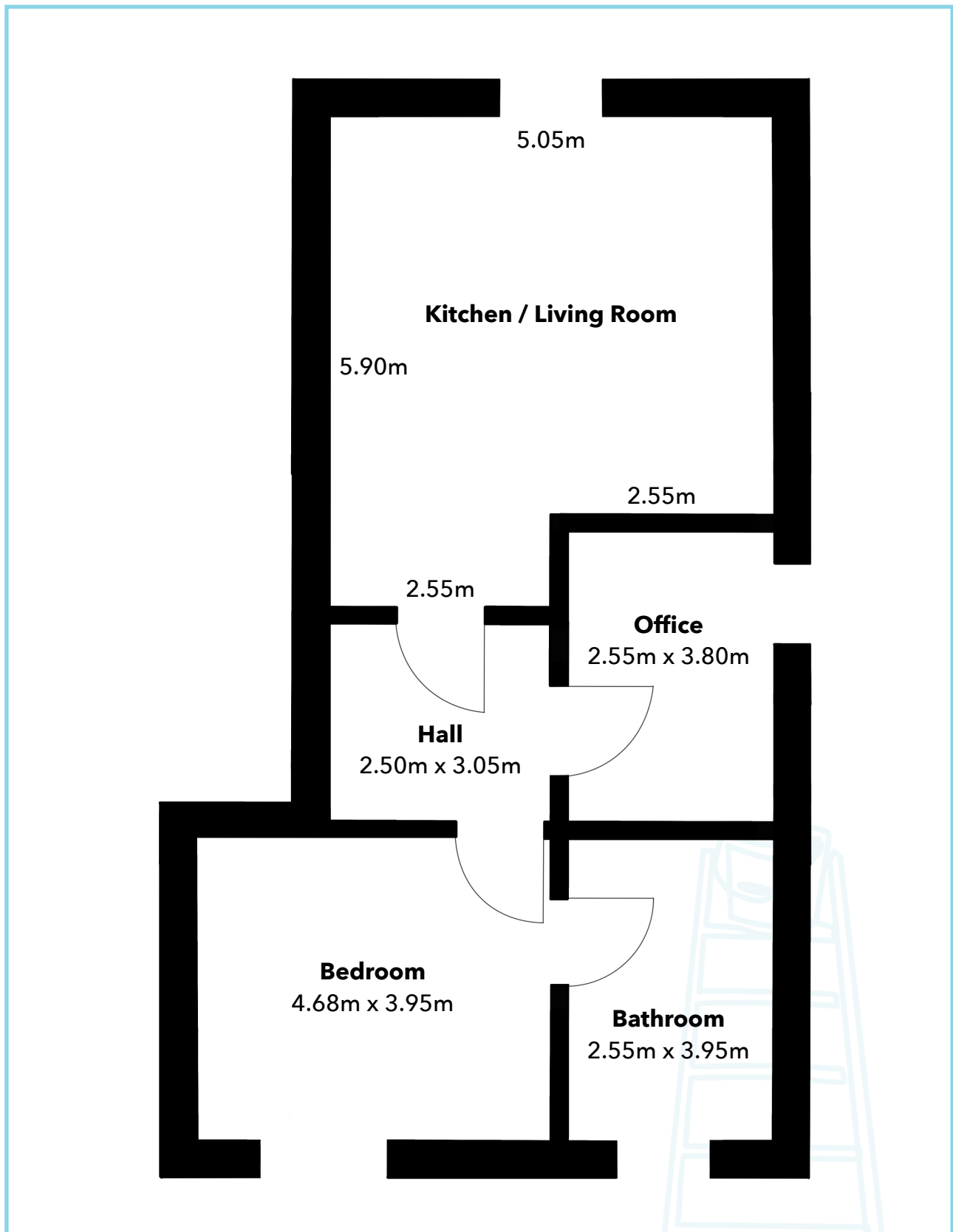
Taking into consideration where these items of furniture are likely to be located in a flat, which flat would best suit this furniture?

As the furniture will take up nearly  $6\text{m}^2$  of floor space, this leaves nearly  $12.5\text{m}^2$  of floor space in Flat 1's bedroom and just  $9.4\text{m}^2$  of floor space in Flat 2's bedroom. Flat 2 also has a slightly unusual shape, which may impact Amanda's ability to comfortably fit her furniture in it and enjoy the remaining space.

7. Which flat do you think Amanda should choose? Use a mixture of quantitative and qualitative reasons to support your choice.

Flat 1 is the better option from a value for money perspective. Additionally, Amanda is able to repaint Flat 1 to her taste in exchange for a discount. Lastly, Amanda is better able to fit her existing bedroom furniture in the Flat 1 bedroom, which will save her having to buy new furniture.

# Flat 1 floor plan



# Flat 2 floor plan

