

Solution

Pupils should calculate the difference between the value of the current apartment, and its value if it had the extension:

$$\text{Difference} = \pounds 145\,000 - \pounds 115\,000 = \pounds 30\,000$$

Pupils should calculate how much the extension will cost:

$$\text{Area of extension: } 4.8\text{ m} \times 2.7\text{ m} = 12.96\text{ m}^2$$

$$\text{Cost of extension without additional 20\% expenses: } 12.96\text{ m}^2 \times \pounds 1500\text{ per m}^2 = \pounds 19\,440$$

$$\text{Cost of extension with additional 20\% for expenses: } \pounds 19\,440 \times 1.2 = \pounds 23\,328$$

Pupils should calculate the profit from selling the apartment with an extension:

$$\text{Profit without 20\% additional expenses: } \pounds 30\,000 - \pounds 19\,440 = \pounds 10\,560$$

$$\text{Profit with additional 20\% for expenses: } \pounds 30\,000 - \pounds 23\,328 = \pounds 6672$$

Profit as a percentage of the current value:

$$\text{Without 20\% additional expenses: } \frac{10560}{115000} \times 100 \approx 9.2\% \qquad 9.2\% > 6\%$$

$$\text{With 20\% additional expenses: } \frac{6672}{115000} \times 100 \approx 5.8\% \qquad 5.8\% < 6\%$$

Depending on the cost of the additional expenses, Amelia could make a profit of between 5.8% and 9.2% on the current value of the apartment – (5.8% < p < 9.2%).

While 5.8% is smaller than 6%, it is not that much smaller. If Amelia keeps her additional expenses down, so that they are slightly less than 20% (~18.8%)* then she will make the profit she hopes for. Her additional expenses are up to 20% – so they could be less than 20%.

Amelia should buy the apartment.

***Percentage of additional expenses needed to make a profit of 6%:**

$$\text{Profit} = \pounds 115\,000 \times 0.06 = \pounds 6900$$

$$\text{Cost of extension} = \pounds 30\,000 - \pounds 6900 = \pounds 23\,100$$

$$\text{Increase in cost of extension} = \pounds 23\,100 - \pounds 19\,440 = \pounds 3660$$

$$\text{Percentage} = \frac{3660}{19440} \times 100 \approx 18.8\%$$

