Problem Solving in Mathematics

Shape, Space, Measures

Painting and Decorating

Solution

Pupils can use diagrams to visualise the plan of the room and the walls.

Area of side walls:	$4 \times 2.4 \times 2 = 19.2\ m^2$
Area of front and back walls:	$4.5 \times 2.4 \times 2 = 21.6\ m^2$
Total area of walls:	$40.8\ m^2$

Subtract the area of:

- doorway converted from mm to metres: $0.9\ m \times 2.1\ m = 1.89\ m^2$
- chimney breast: $1.2\ m \times 2.4\ m = 2.88\ m^2$
- windows converted from mm to metres: $0.9\ m \times 1.45\ m \times 2 = 2.61\ m^2$.

The total area to be subtracted is $7.38\ m^2$

The total area of walls to be painted: $40.8\ m^2 - 7.38\ m^2 = 33.42\ m^2$
Two coats: $33.42\ m^2 \times 2 = 66.84\ m^2$

One litre of paint covers $10\ m^2$ so 6.684 litres are needed.
The cheapest is one 5 litre tin and one 2.5 litre tin, at a cost of £36.99 + £19.99 = **£56.98**

The area of ceiling to be painted = Total area of ceiling subtract area at top of the chimney breast = $(4.5\ m \times 4\ m) - (1.2\ m \times 0.6\ m) = 18\ m^2 - 0.72\ m^2 = 17.28\ m^2$
Two coats: $17.28\ m^2 \times 2 = 34.56\ m^2$

One litre of paint covers $10\ m^2$ so 3.456 litres are needed.
The cheapest is one 2.5 litre tin and a one litre tin at a cost of £12.99 + £5.99 = **£18.98**

Labour: £90 × 1.5 = **£135**

Total cost: £56.98 + £18.98 + £135 = **£210.96**

The cheapest quote that Edel could give for the cost of the contract is £210.96.