Example calculations for Building Principles revision

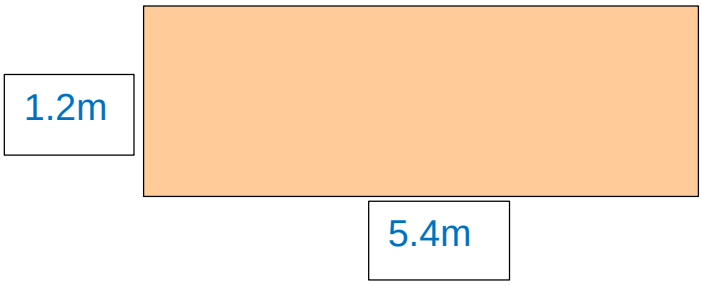
Name _____ Date _____

A reminder about scale

On a 1:10 scale diagram a 10mm line would represent 100mm.

(10 x 10 = 100)

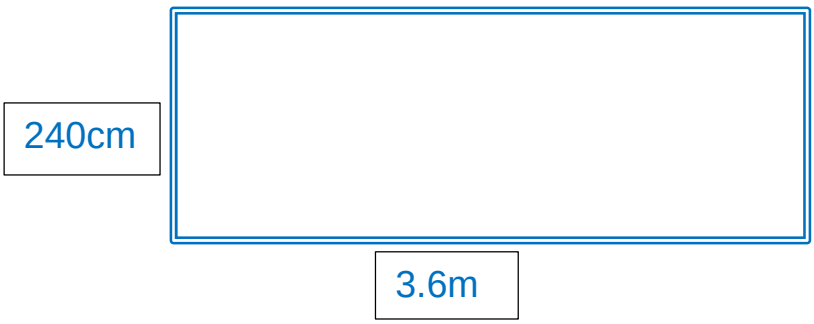
Q1. What is the **area** of this wall?



Area of a rectangle = length x width

Answer = 5.4 x 1.2 = **6.48 m²**

Q2. What **length** of skirting board is needed to go **around** this floor?



First convert cm to metres (divide by 100).

So, 240 cm = 2.4m

Then 2.4m + 2.4m + 3.6m + 3.6m = **12 m skirting board**

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Q3. What **volume** of concrete is needed for this single strip foundation?

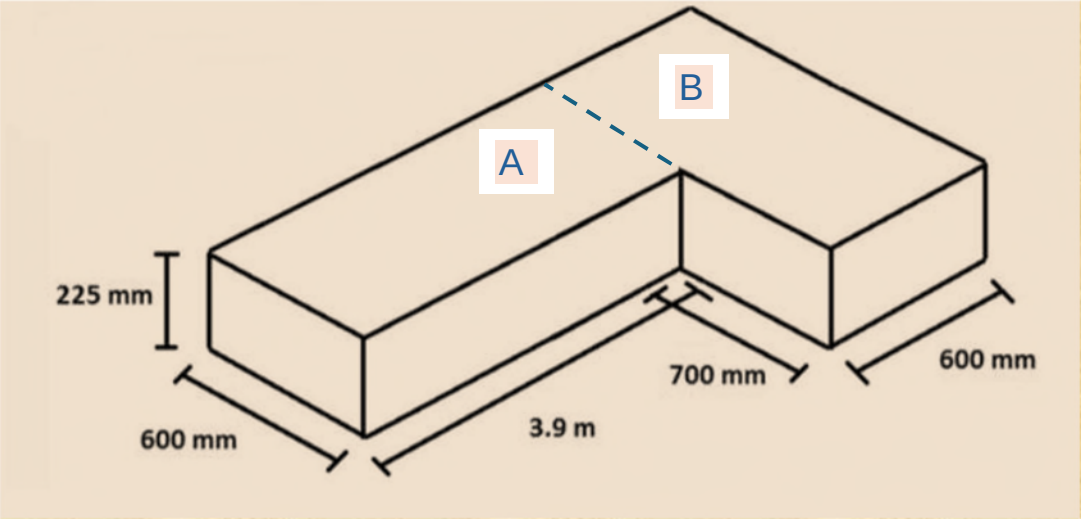


Image source: https://www.cityandguilds.com/qualifications-and-apprenticeships/construction/learning-resources (Sample test - Level 2 Principles of Building Construction, Information and Communication.)

First divide the mm measurements by 1000 so all units are in metres.

700 mm / 1000 = 0.700 m. 600 mm / 1000 = 0.600 m.

Then split the shape into 2 cuboids (A and B).

Calculate the volume of each cuboid.

Volume of cuboid = l x w x h (length x width x height)

A 3.9 x 0.600 x 0.225 = **0.5265 m^3**

B Length = 0.600 + 0.700 = 1.300 m

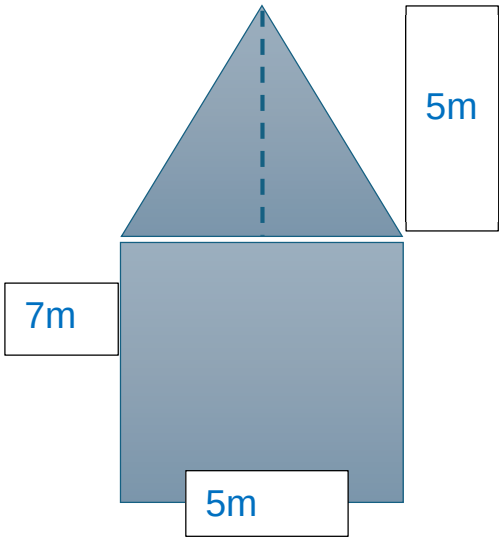
Volume = 1.3 x 0.600 x 0.225 = **0.1755 m^3**

Total is 0.5265 + 0.1755 = **0.702 m^3 concrete**

Name _____ Date _____

Q4. How much paint should be bought to cover a gable end with **two** coats?

1 litre paint covers 12 m².



Rectangle

7 x 5 = **35 m²**

Triangle

Area of a triangle is **(base x height) divided by 2** (b x h / 2)

5 x 5 = 25

25 / 2 = **12.5 m²**

Total area of gable end = 35 +12.5 = **47.5 m²**

1 litre paint covers 12 m². How much paint needed for 2 coats.

So, Area of gable end x 2 (for 2 coats) = 47.5 x 2 = **95 m²**

95 / 12 = 7.916

Therefore, **8 litres paint** must be bought.

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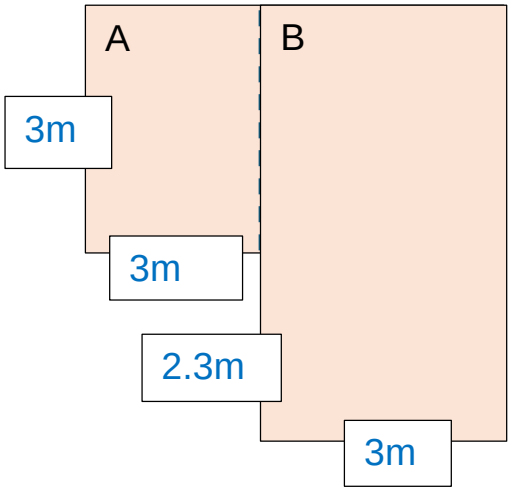
Q5. How many metres of floor boarding will be required to cover this floor area? The floor boarding is **120mm** wide.



First divide 120mm by 1000 = 0.12m

Then divide the shape into 2 rectangles

A is 3m x 3m

B is (2.3m + 3m) x 3m = 5.3m x 3m

Now calculate the amount of floor boarding.

Divide the width of each rectangle by the width of the floorboarding. Then multiply your answers by the length of each rectangle.

<u>Rectangle A</u>

3 / 0.12 = 25 25 x 3 = 75m

<u>Rectangle B</u>

3 / 0.12 = 25 25 x 5.3 = 132.5m

<u>Total length of boarding</u>

132.5 + 75 = **207.5 m boarding**