Scale Diagrams

-- Have correct proportions (reflects reality)
-- Useful because the diagram can be measured
-- Scale factors provide the relationship Between the map and reality:
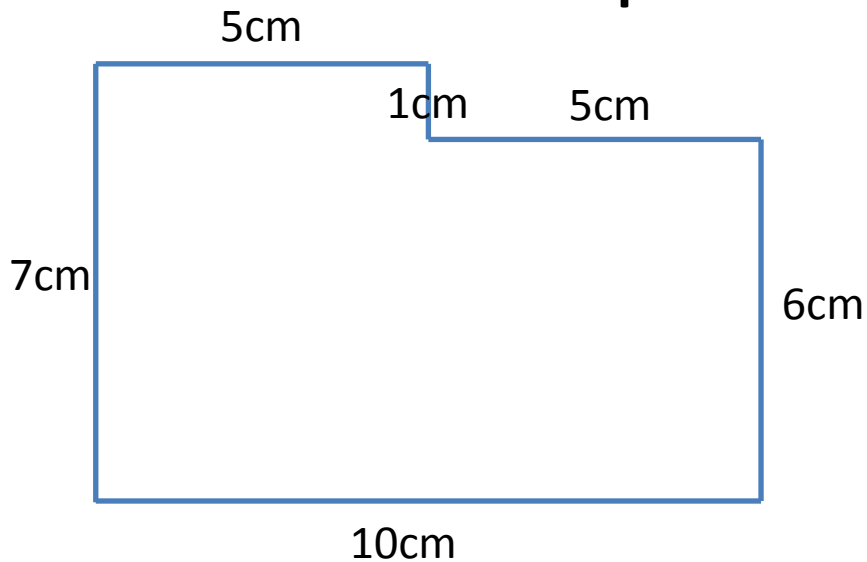
Example   1cm : 2m

15cm on a map would mean (15)(2) = 30m

Example: We are renovating a bedroom by

-- replacing the baseboards (goes around the room where the wall meets the floor)

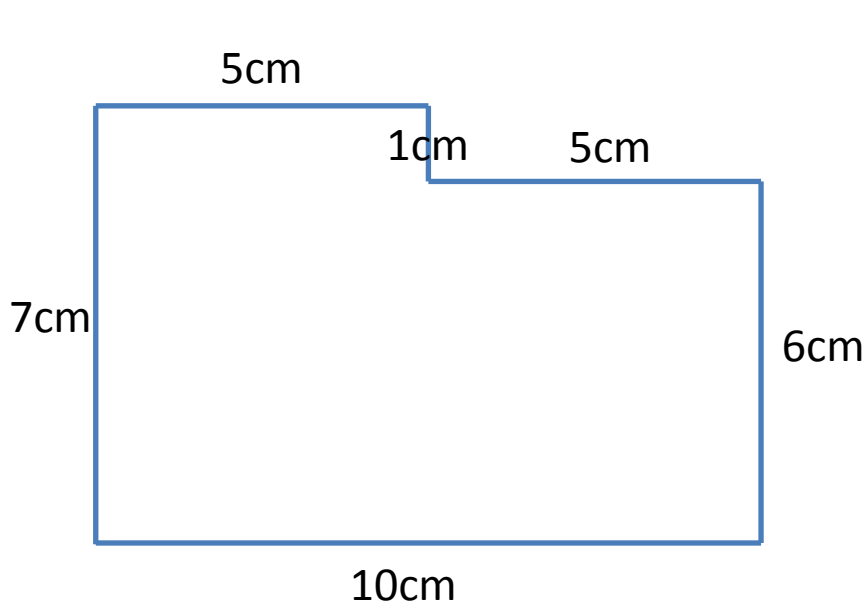-- installing new flooring

We obtain the plans for the room

5cm

1cm   5cm

7cm

6cm

10cm

Scale Factor   1cm:2ft

How long of a baseboard material
Do we need to buy?

Perimeter: 5+1+5+6+10+7 = 34cm
In reality: (34)(2) = **68ft**

Example: We are renovating a bedroom by
-- replacing the baseboards
-- installing new flooring

If we want the same room layout and proportion but bigger,
We can increase the scale factor by adding **3 ft**
What does that do to the perimeter?

Scale Factor   1cm:**5**ft   (2+3)

How long of a baseboard material
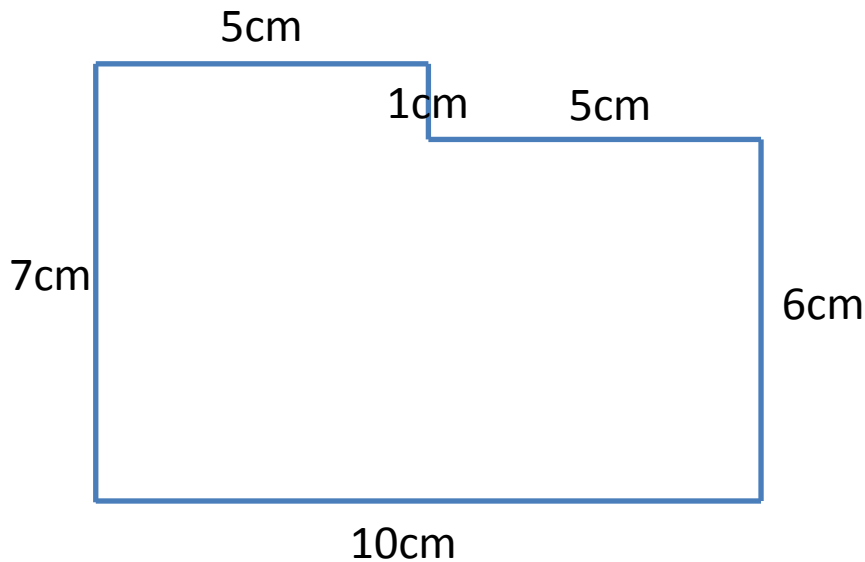Do we need to buy?

Perimeter: 5+1+5+6+10+7 = 34cm
In reality: (34)(5) = **170ft**

170 – 68 = 102

102 comes from 34*3 because for every
cm in the diagram, we have 3 more ft in reality

5cm

1cm   5cm

7cm

6cm

10cm

Example: We are renovating a bedroom by
-- replacing the baseboards
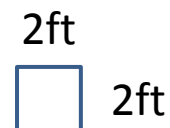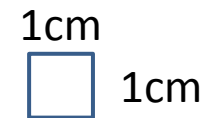## -- installing new flooring

How much flooring do we buy?

Scale Factor   1cm:2ft

Area: Cut off top 5x1 = 5cm²
         rest 10x6 = 60cm²
         total 60 + 5 = **65cm²**

In reality: (65)(4) = **260ft²**

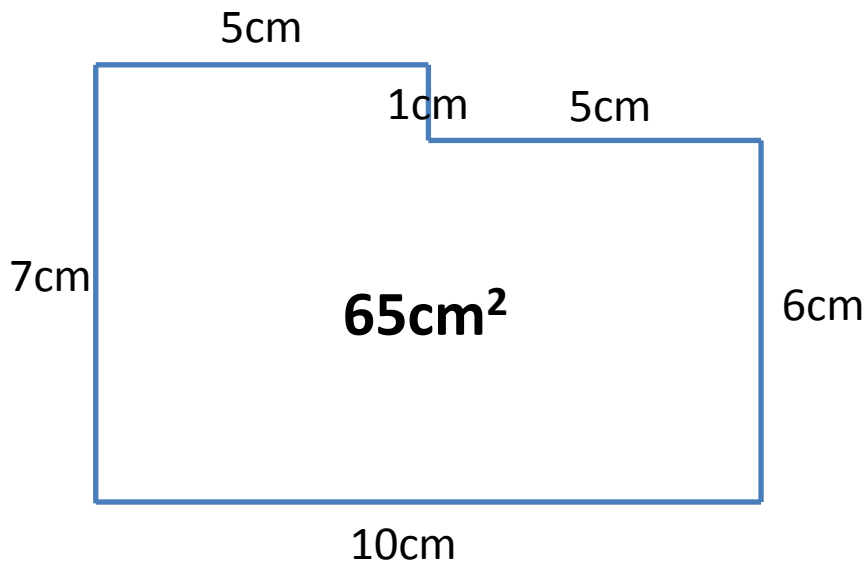$$\frac{1cm}{2ft}$$

1cm
1cm

2ft
2ft

5cm
1cm
5cm
7cm
6cm
10cm

NOTE: square unit relationship   1cm²: 4ft²

Example: We are renovating a bedroom by
-- replacing the baseboards
-- installing new flooring
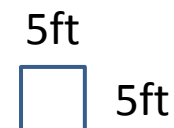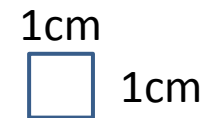
How much flooring do we buy for the big room?

Scale Factor   1cm:5ft

Area: Cut off top 5x1 = 5cm²
            rest 10x6 = 60cm²
            total 60 + 5 = **65cm²**
In reality: (65)(25) = **1625ft²**

5cm

1cm   5cm

7cm

65cm²

6cm

10cm

$\dfrac{1cm}{2ft}$ 1cm

1cm

5ft

5ft

Example: We are renovating a bedroom by
-- replacing the baseboards
-- installing new flooring
How much bigger did the room get in area?

5cm

1cm   5cm

7cm

65cm²

6cm

10cm
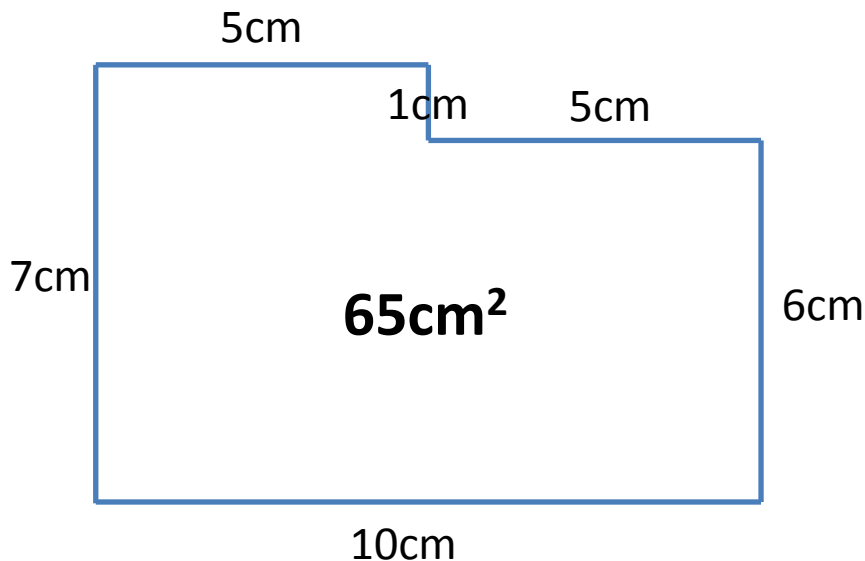
Scale Factor   1cm:5ft

Area of small room: **260ft²**

Area of big room: (65)(25) = **1625ft²**

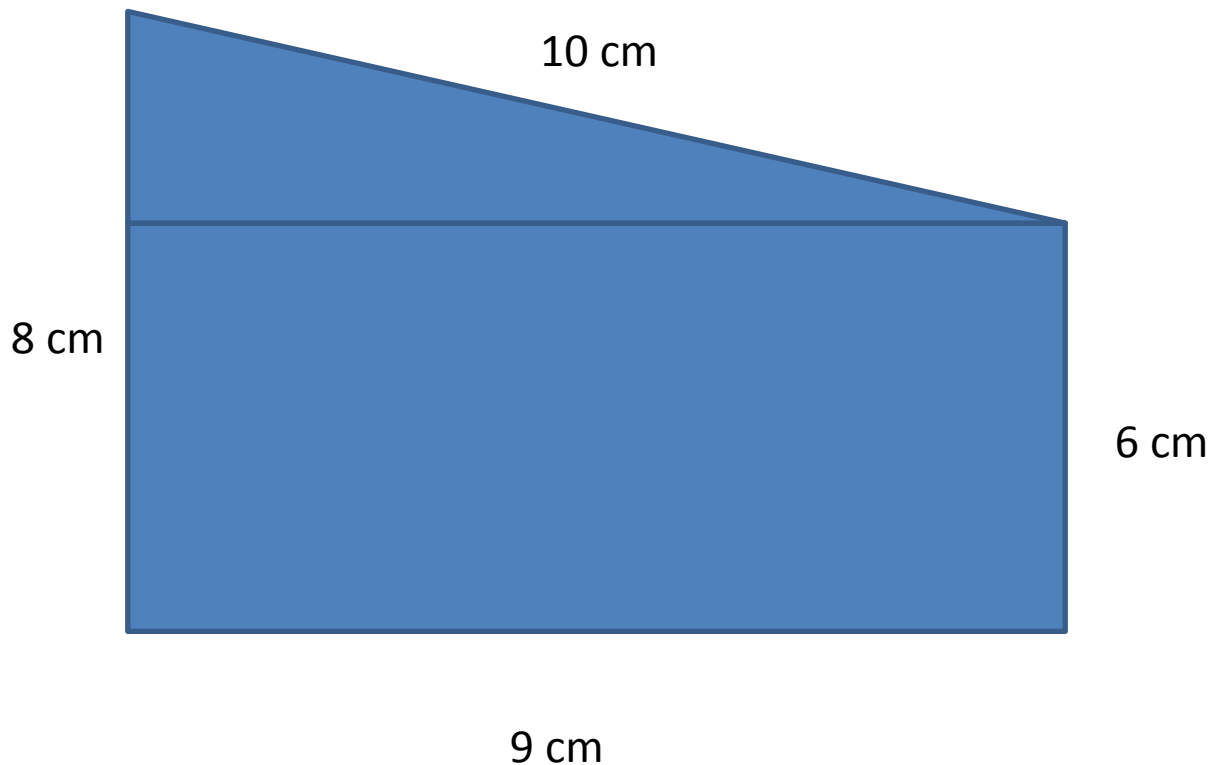Difference: 1625 − 260 = 1365ft²

Where does the 1365 come from?

The scale factor increased by 3…

We multiply the diagram area by 9 (square units)

Example: Consider the following scale Diagram and determine the Perimeter And Area in reality
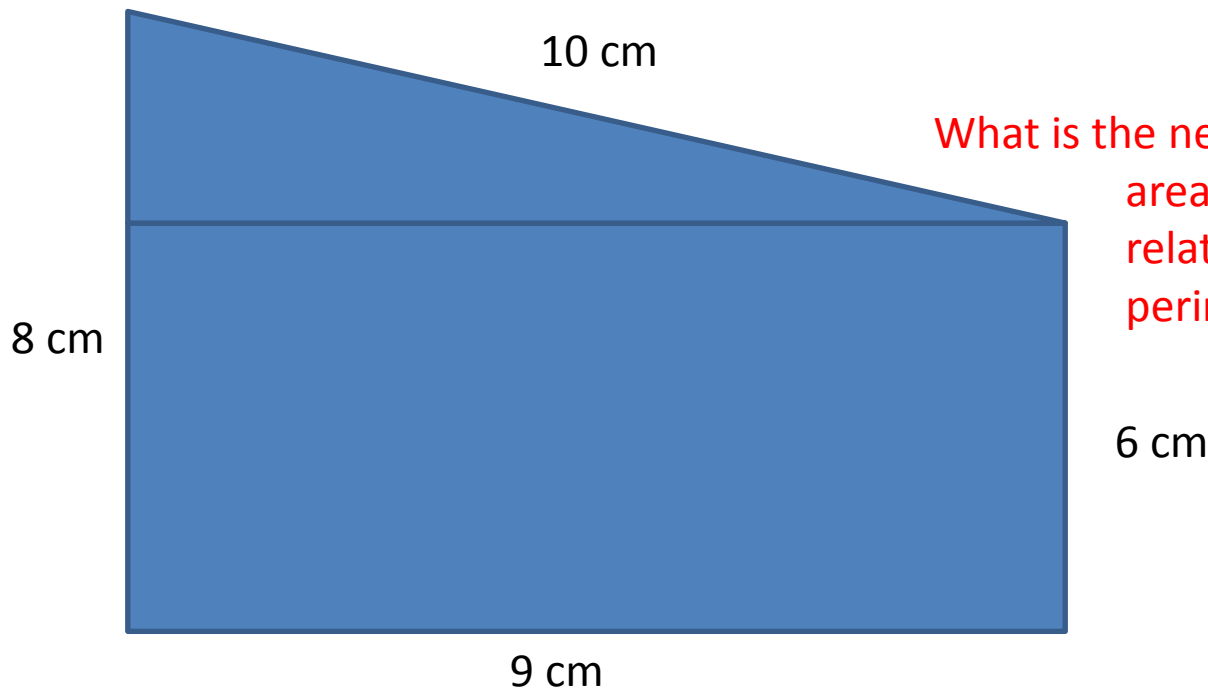
Scale Factor: 1cm : 3ft

10 cm

8 cm

6 cm

9 cm

Perimeter: 33cm → (33)(3) = 99 ft
Area: 63cm² → (63)(9) = 567 ft²

Example: Consider the following scale Diagram and determine the Perimeter And Area in reality

10 cm

8 cm

6 cm

9 cm

New Perimeter: 231 ft (from 99 ft)
New Area: (from 567 ft²)