The Area of Rectangles and Squares

To find the area of any rectangle, or square, we use the formula **Area = L x W.**
Knowing how to calculate area is very useful if we want to cost a job which involves covering a particular object with a particular material.
We can do this in steps.

For example, suppose we want to tile a small patio.
First, we work out the area we want to cover.
The patio is a rectangle 6 feet long and 4 feet wide.
The area of the patio is its Length x its Width.
6 x 4 = 24.
The area we will tile is 24 **square feet**.

Width

PATIO

Area = L x W
= 6 ft x 4 ft
= 24 square feet

Length

6 ft

4 ft

The tiles are square.
Each tile measures 1ft x 1ft.
The area of each tile is 1 sq ft.
Each tile costs $1.10

Next, we find how many tiles we will need.
To find the number of tiles we need, we divide the area of the patio by the area of one tile.
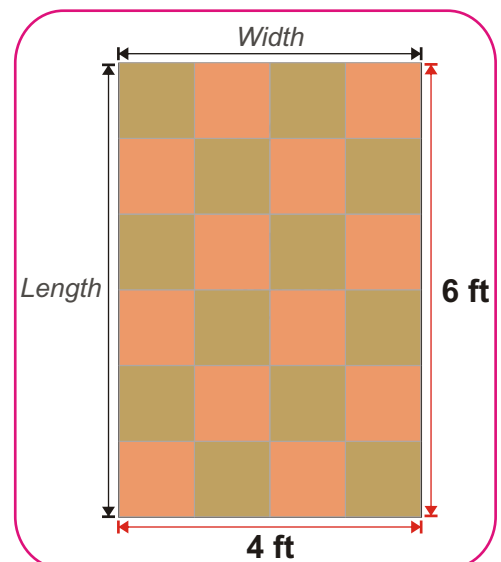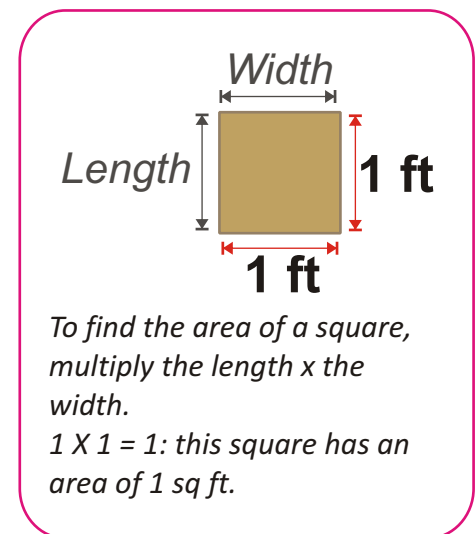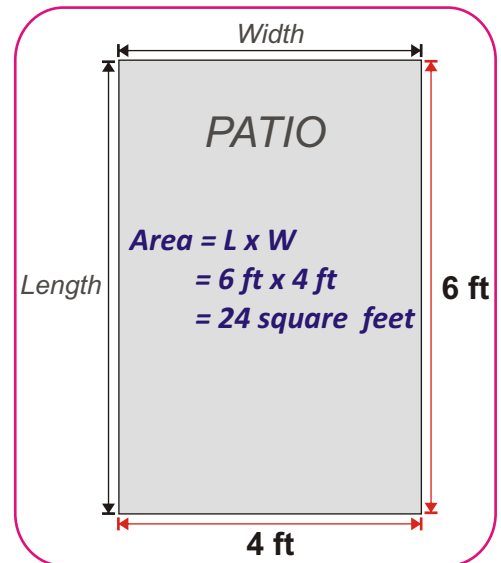24 divided by 1= 24.
So, we need 24 tiles.

Width

Length

1 ft

1 ft

To find the area of a square, multiply the length x the width.
1 X 1 = 1: this square has an area of 1 sq ft.

To cost this job, we **multiply the quantity of the material by the cost of the material.**
We need 24 tiles.
Each tile costs $1.10 cents.
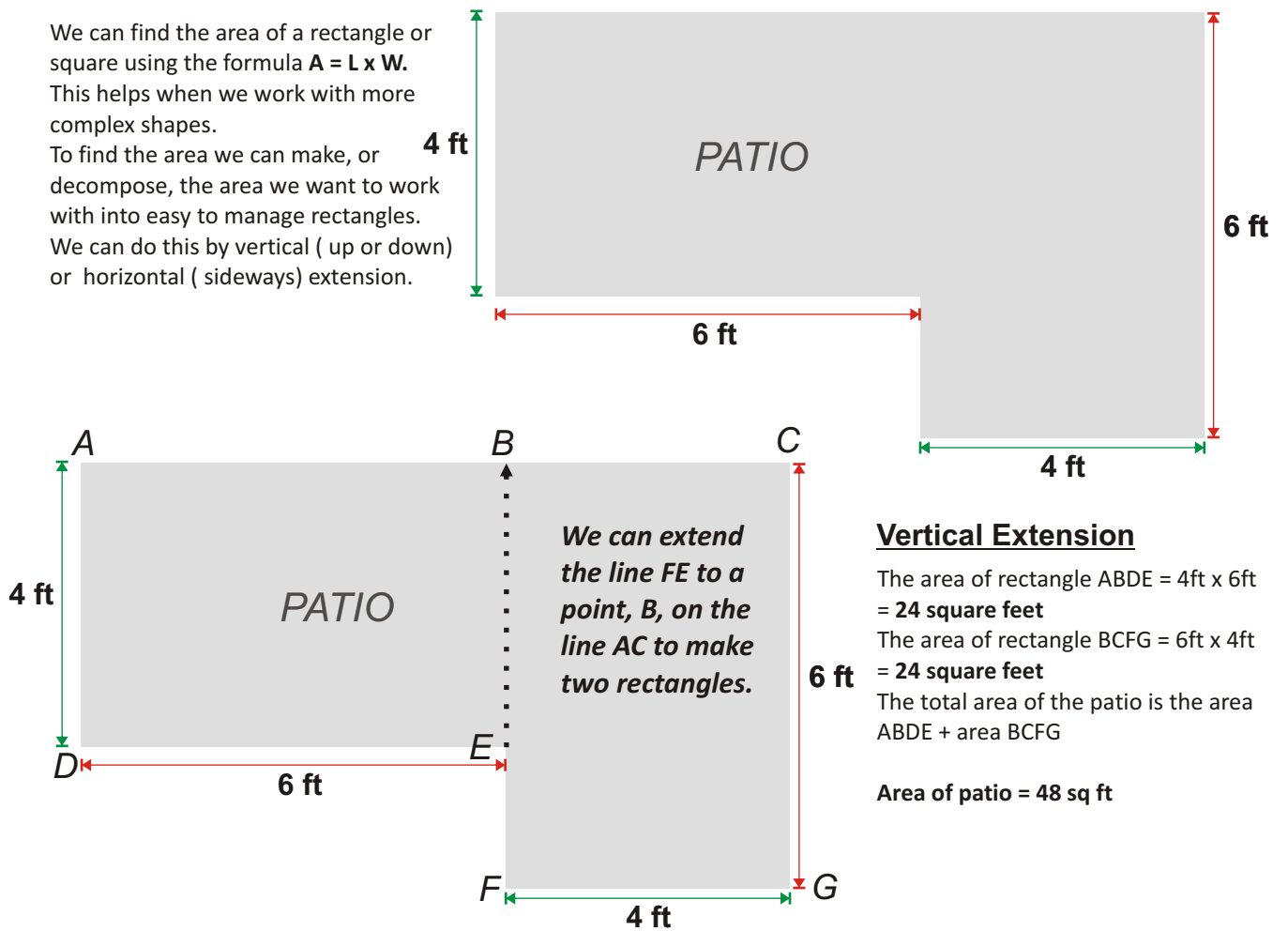The tiles to cover the patio will cost 24 x $1.10

= **$26 .40 cents.**

Width

Length

6 ft

4 ft

Decomposition - making easy-to-work-with units

We can find the area of a rectangle or square using the formula **A = L x W.** This helps when we work with more complex shapes.
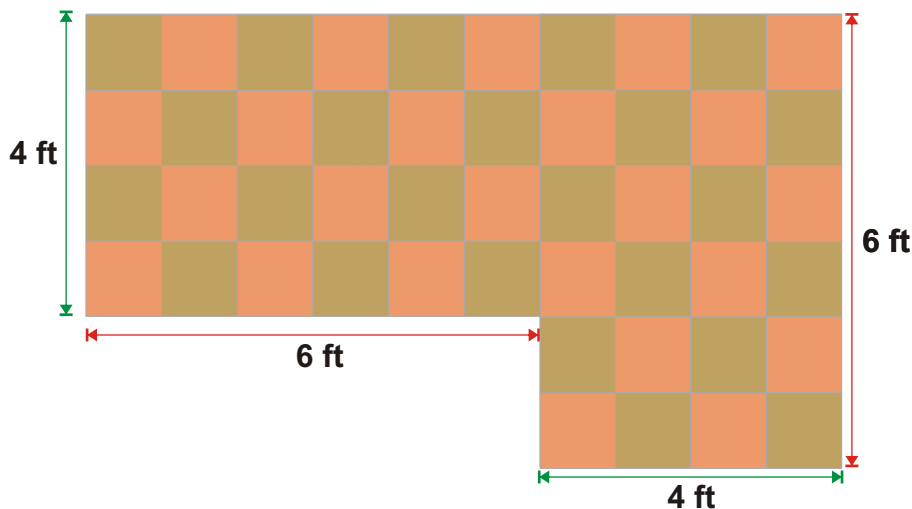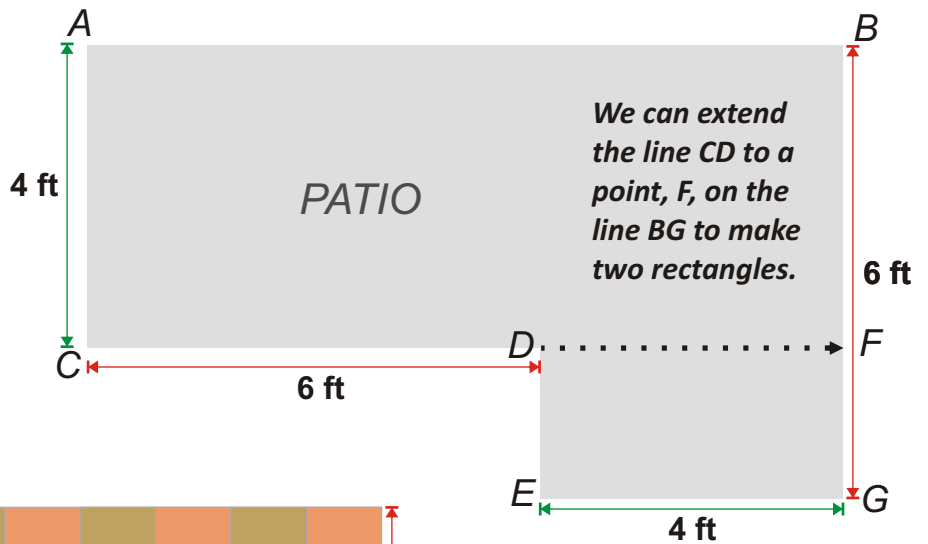
To find the area we can make, or decompose, the area we want to work with into easy to manage rectangles. We can do this by vertical (up or down) or horizontal (sideways) extension.

4 ft

PATIO

6 ft

6 ft

4 ft

A | B | C

4 ft

PATIO

We can extend the line FE to a point, B, on the line AC to make two rectangles.

6 ft

D | **6 ft** | E

F | **4 ft** | G

Vertical Extension

The area of rectangle ABDE = 4ft x 6ft = **24 square feet**
The area of rectangle BCFG = 6ft x 4ft = **24 square feet**
The total area of the patio is the area ABDE + area BCFG

Area of patio = 48 sq ft

Horizontal Extension

From addition, **CF = CD + EG = 10 ft**
From subtraction, **FG = BG - AC = 2 ft**
The area of rectangle ABCF = 4ft x 10ft = **40 square feet**
The area of rectangle DFEG = 2ft x 4ft = **8 square feet**
The total area of the patio is area ABCF + area DFEG

Area of patio = 48 sq ft

A | B

4 ft

PATIO

We can extend the line CD to a point, F, on the line BG to make two rectangles.

6 ft

C | **6 ft** | D .... F
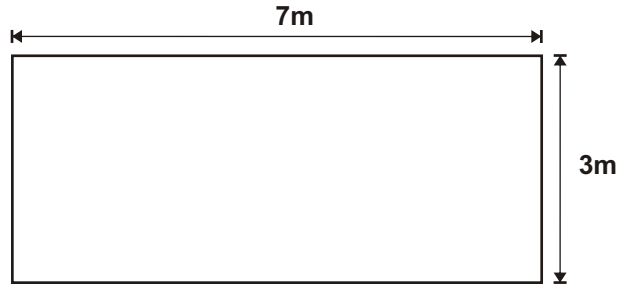
E | **4 ft** | G

4 ft

6 ft

6 ft

4 ft

Costing the Patio

Total area of patio = 48 sq ft
Area of tile = 1 sq ft
Number of tiles needed = 48
Cost per tile = $1.10
Total cost = $52.80
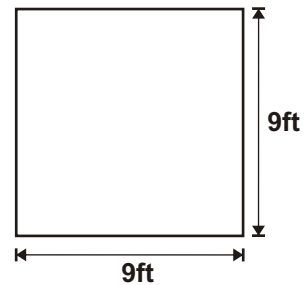
Exercises

7m

3m

T1
Building a wall

1.The wall of a house is three metres high and seven metres long.
What is the area of the wall? _____

2.Concrete blocks cost $5 per square metre.
How much will the blocks for the wall cost? _____

3. There are ten blocks to the square metre.
How many blocks will you need to build the wall? _____

T2
Tiling a bathroom
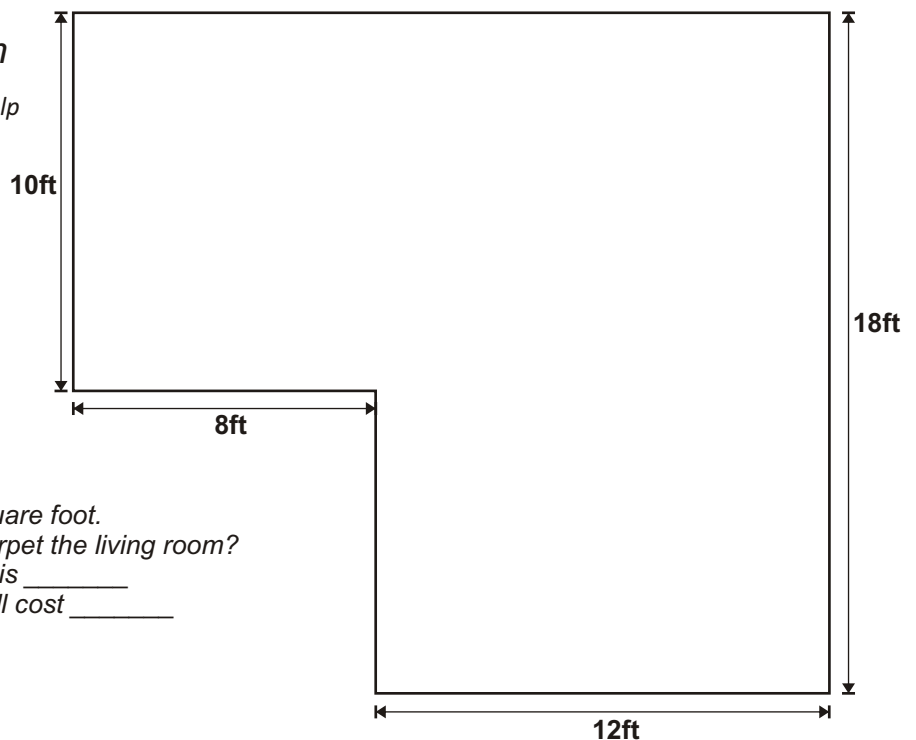
1.A bathroom floor is nine feet long and nine feet wide.
What is the area of the floor?_____

2.Ceramic tiles cost $1.50 per square foot.
How much will the tiles for the floor cost? _____

3. There are 4 tiles to the square foot.
How many tiles will you need to cover the floor?_____

9ft

9ft

T3
Carpeting a living room

*(You can label the diagram to help
solve this problem)*

10ft

18ft

8ft

12ft

Carpet costs $9.00 per square foot.
How much will it cost to carpet the living room?
The total area of the room is _____
The carpet for the room will cost _____