

Higher Order Thinking Skills

Primary 5

Lesson 5:

Area & Perimeter (II)

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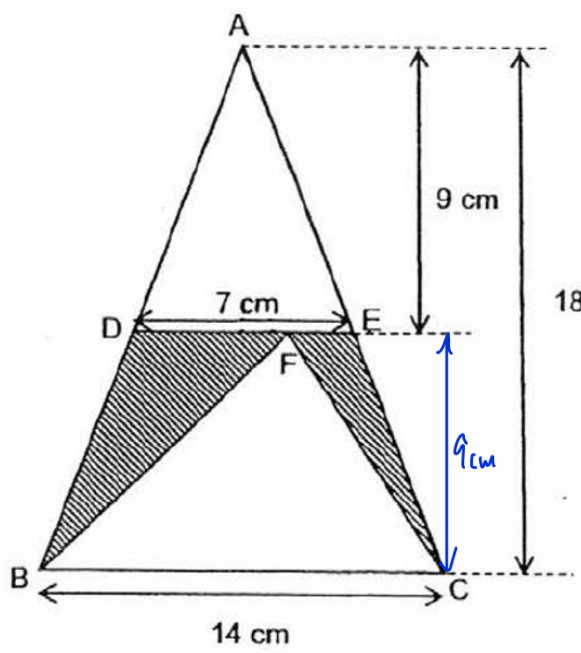
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LESSON 8 Area & Perimeter (II)

GUIDED EXAMPLE 1

Visualisation

The figure is made up of triangles.
Find the total area of the shaded parts.



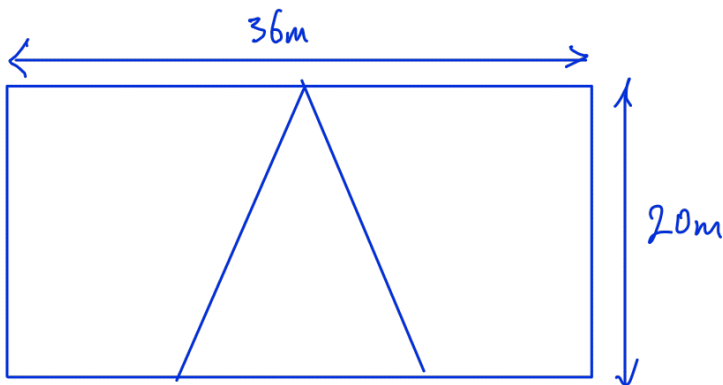
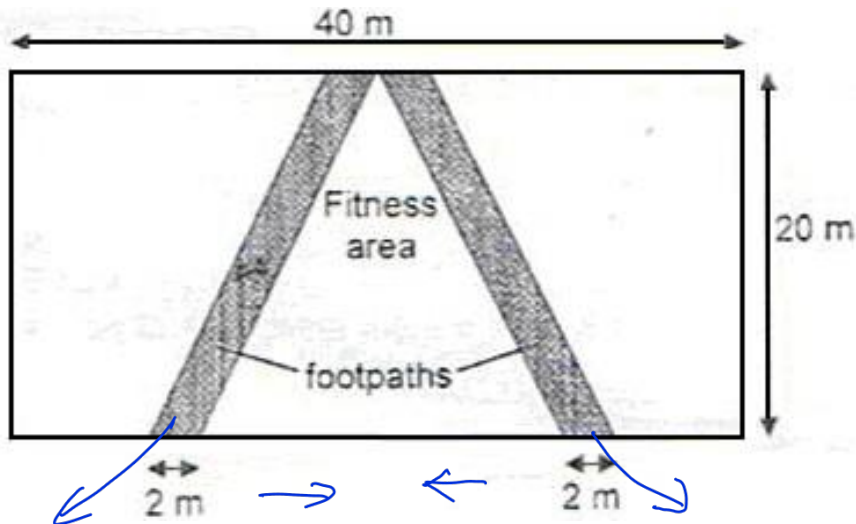
Shaded area
 = Area of $\triangle ABC$ - Area of $\triangle ADE$ - Area of $\triangle BFC$
 $18 \text{ cm} = \frac{1}{2} \times 14 \times 18 - \frac{1}{2} \times 7 \times 9 - \frac{1}{2} \times 14 \times 9$
 $= 31.5$

Ans : 31.5 cm²

GUIDED EXAMPLE 2

Rearrangement of Parts

The figure below shows a rectangular field with a fitness area in the shape of an isosceles triangle. Grey footpaths in the shape of parallelograms are paved on two sides of the fitness area. What is the total area of the grey footpaths?



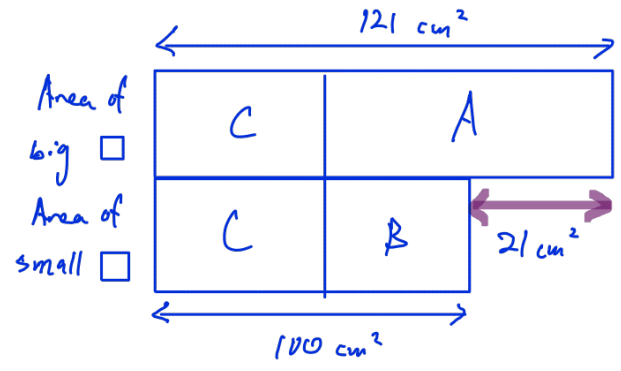
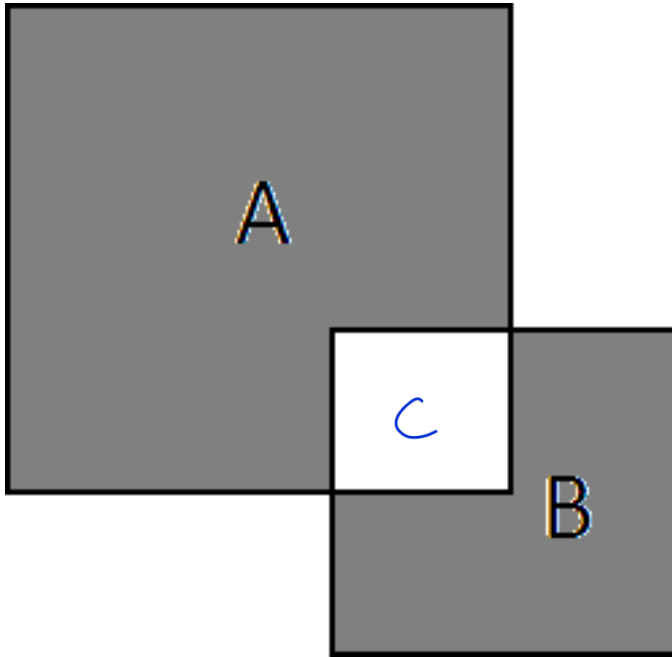
$$40 \times 20 - 36 \times 20 = 80$$

Ans: 80 m²

GUIDED EXAMPLE 3

Difference in Area

The figure below shows both squares A and B, of sides 11 cm and 10 cm respectively. Both squares overlap each other partially. Find the difference between the two shaded areas.



$$11 \times 11 = 121$$

$$10 \times 10 = 100$$

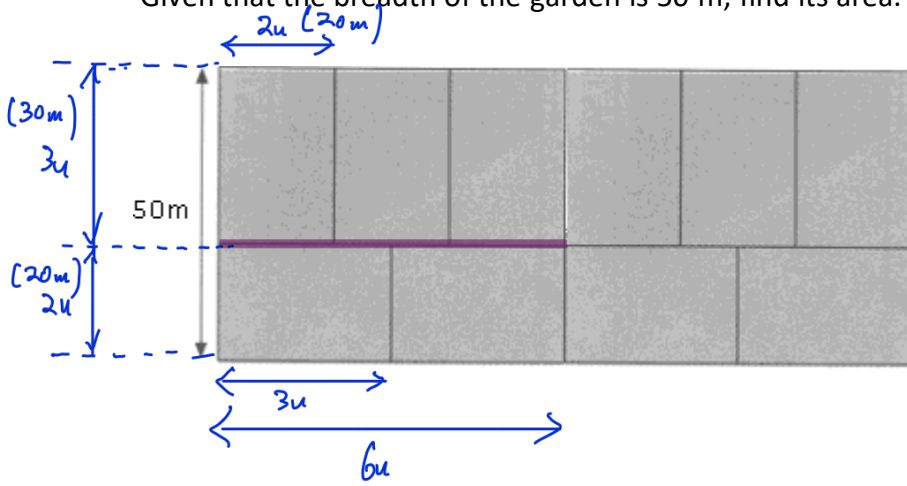
$$121 - 100 = 21$$

Ans : 21 cm²

GUIDED EXAMPLE 4

Use of Ratio

A farmer wanted to divide his garden into 10 similar rectangular plots as shown below. Given that the breadth of the garden is 50 m, find its area.



* 3 breadths same as 2 lengths *

2, 4, 6

3, 6

$$3u + 2u = 50$$

$$5u = 50$$

$$1u = 50 \div 5$$

$$= 10$$

$$3u = 3 \times 10$$

$$= 30$$

$$2u = 2 \times 10$$

$$= 20$$

$$\begin{aligned} \text{Area of entire garden} &= 10 \times 30 \times 20 \\ &= 6000 \end{aligned}$$

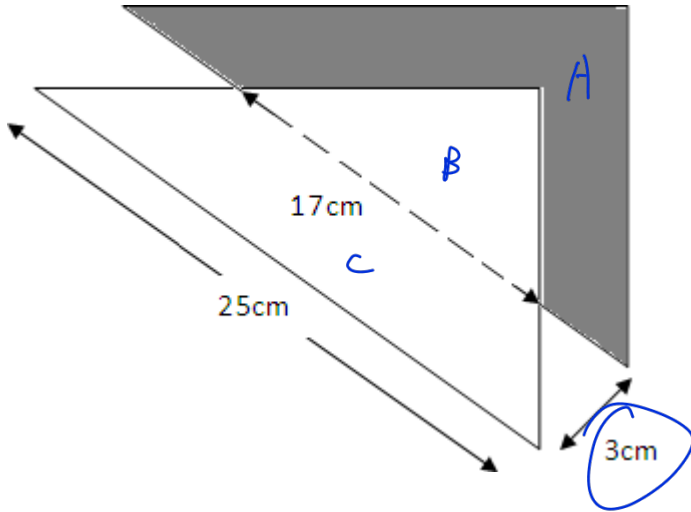
Ans: 6000 m²

GUIDED EXAMPLE 5

~~Systematic Listing~~

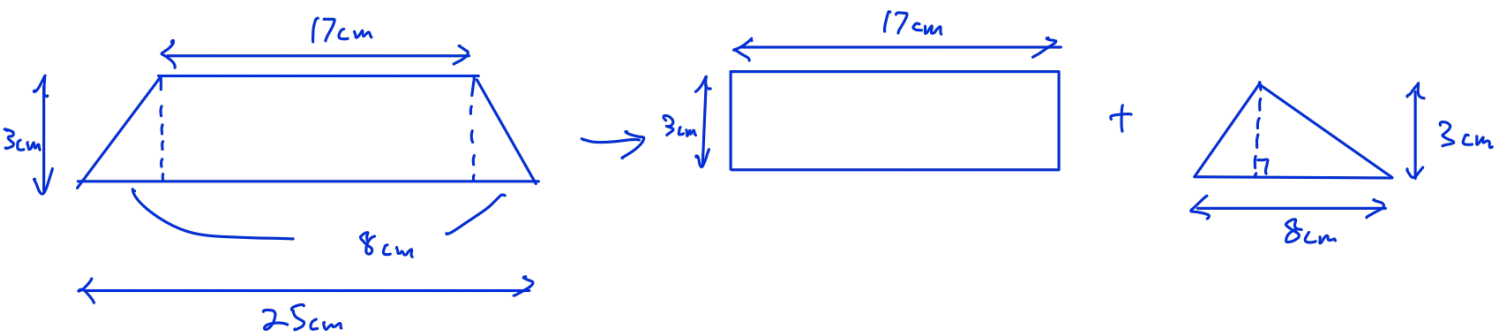
Diff in area

Two identical right-angled triangles overlap each other as shown below.
Find the area of the shaded part.



A	B
C	B

* To find Area of A, we can find the area of C instead.

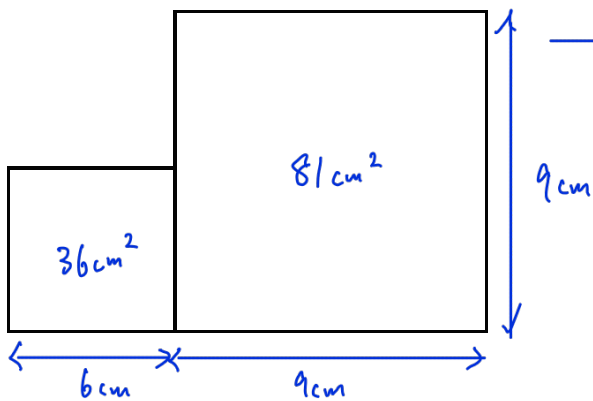


$$\begin{aligned} \text{Required area} &= 17 \times 3 + \frac{1}{2} \times 8 \times 3 \\ &= 63 \end{aligned}$$

Ans : 63 cm²

GUIDED EXAMPLE 6

The figure is formed by 2 squares. The side of each square is a whole number. *→ Hint to use listing*
 If the total area of the figure is 117 cm^2 , what is the perimeter of the figure?



$$81 + 36 = 117$$

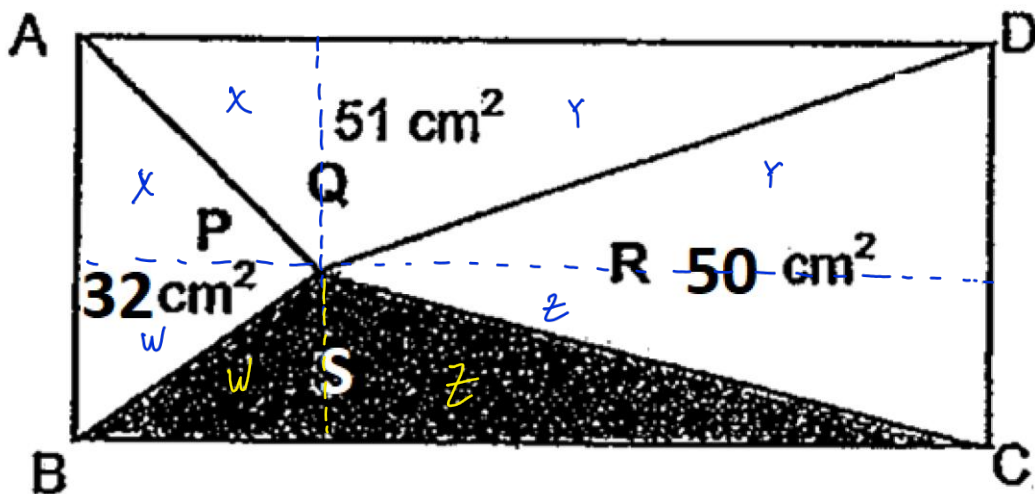
$$(9 + 9 + 6) \times 2 = 48$$

length (cm)	Area (cm ²)
1	$1 \times 1 = 1$
2	$2 \times 2 = 4$
3	$3 \times 3 = 9$
4	$4 \times 4 = 16$
5	$5 \times 5 = 25$
6	$6 \times 6 = 36$
7	$7 \times 7 = 49$
8	$8 \times 8 = 64$
9	$9 \times 9 = 81$
10	$10 \times 10 = 100$
11	$11 \times 11 = 121$

Ans : 48 cm

GUIDED EXAMPLE 7

ABCD is a rectangle.
 It is divided into 4 different triangles, P, Q, R and S
 which meet at a point as shown.
 Find the area of triangle S.



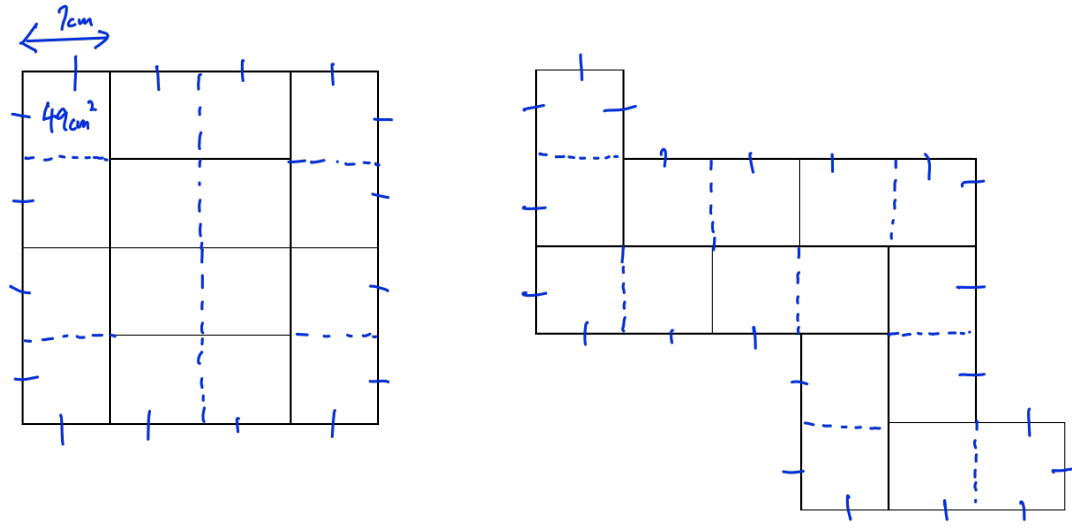
* Area of $\triangle P + \triangle R = \text{Area of } \triangle Q + \triangle S$

$$\begin{aligned} \text{Area of } \triangle S &= 32 + 50 - 51 \\ &= 31 \end{aligned}$$

Ans : 31 cm²

BUILD YOUR UNDERSTANDING

1. Each of the figures below is formed by arranging 8 similar rectangular cards. Both figures have the same area of 784 cm^2 . Find the perimeter of each figure.



1 length is the same as 2 breadths

$$784 \div 16 = 49$$

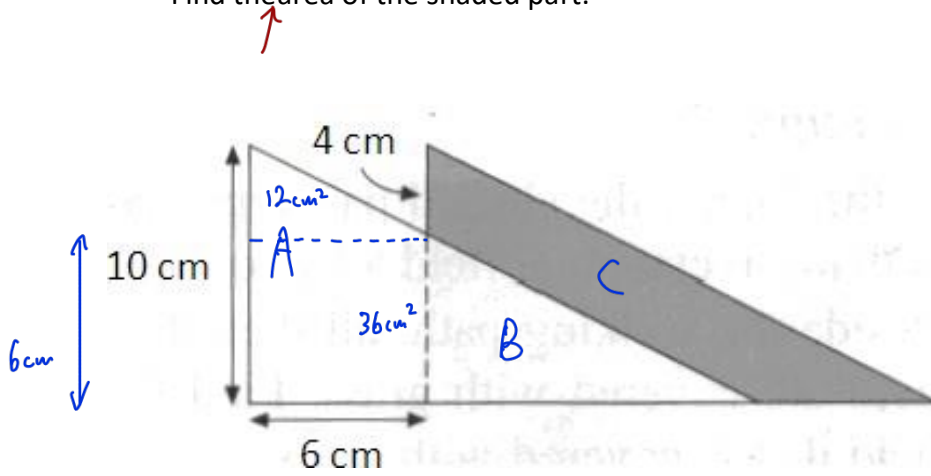
$$\sqrt{49} = 7$$

$$16 \times 7 = 112$$

$$22 \times 7 = 154$$

Ans : 112 cm, 154 cm

2. The figure below shows two similar right-angled triangles overlapping each other. Find the area of the shaded part.



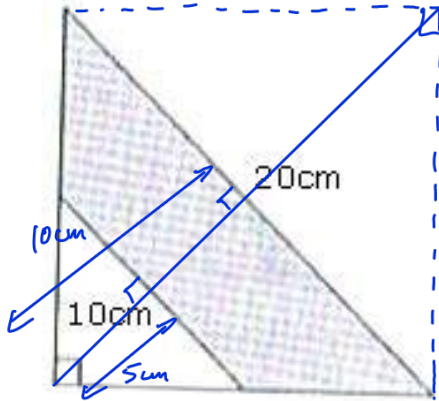
A	B
C	B

* Area of A = Area of C. Find Area of A to find the area of C.

$$\begin{aligned} \text{Area of A} &= 6 \times 6 + \frac{1}{2} \times 6 \times 4 \\ &= 48 \end{aligned}$$

$$\text{Ans} = \underline{48 \text{ cm}^2}$$

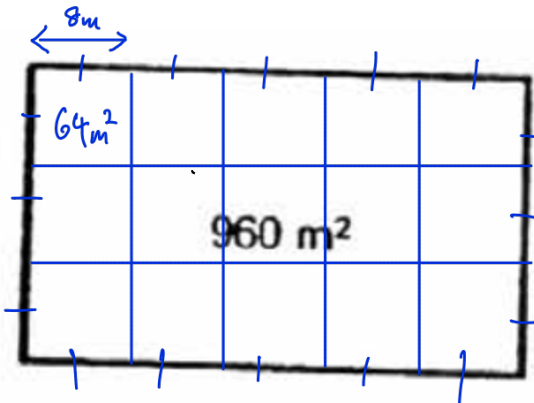
3. The figure below is formed by two isosceles triangles.
 The bases of the triangles are 10 cm and 20 cm respectively.
 Find the area of the shaded region.



$$\begin{aligned}
 \text{Shaded area} &= \text{Area of big } \triangle - \text{Area of small } \triangle \\
 &= \frac{1}{2} \times 20 \times 10 - \frac{1}{2} \times 10 \times 5 \\
 &= 75
 \end{aligned}$$

Ans : 75 cm²

4. A rectangular vegetable plot has an area of 960 m^2 .
 Given that its breadth is $\frac{3}{5}$ of its length,
 find the perimeter of the vegetable plot.



$$960 \div 15 = 64$$

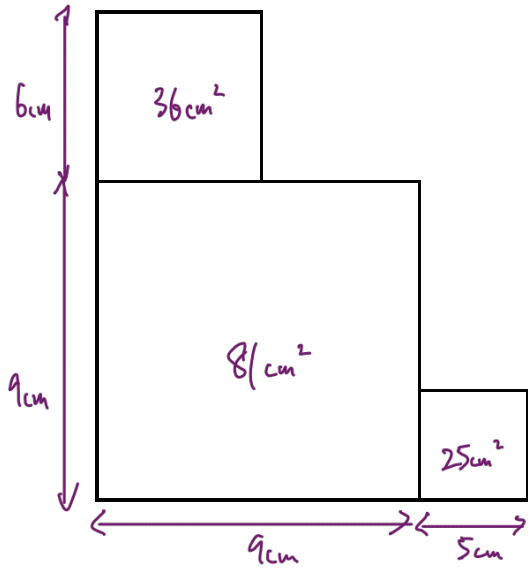
$$\sqrt{64} = 8$$

$$16 \times 8 = 128$$

(Red Swastika P5 CA1 Q10)

Ans: 128 m

5. The figure is formed by 3 squares.
 The side of each square is a whole number.
 If the total area of the figure is 142 cm^2 ,
 what is the perimeter of the figure?



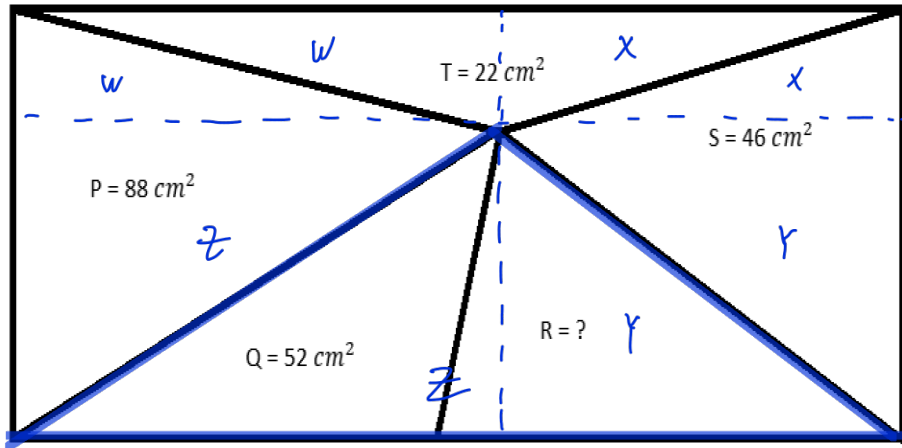
$$81 + 36 + 25 = 142$$

$$(9 + 5 + 9 + 6) \times 2 = 58$$

length (cm)	Area (cm ²)
1	$1 \times 1 = 1$
2	$2 \times 2 = 4$
3	$3 \times 3 = 9$
4	$4 \times 4 = 16$
5	$5 \times 5 = 25$
6	$6 \times 6 = 36$
7	$7 \times 7 = 49$
8	$8 \times 8 = 64$
9	$9 \times 9 = 81$
10	$10 \times 10 = 100$
11	$11 \times 11 = 121$

Ans : 58 cm

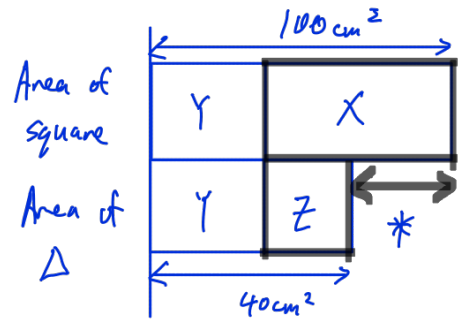
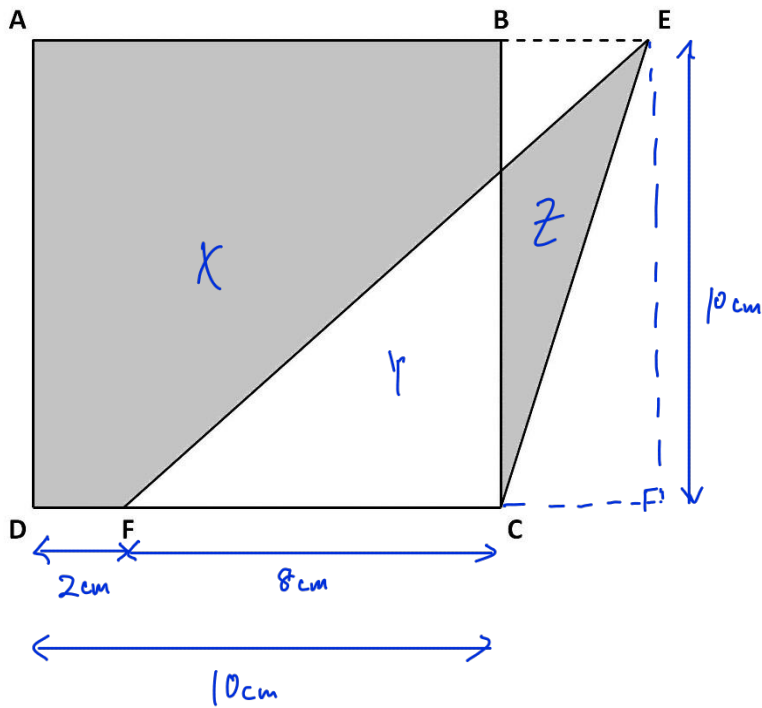
6. The figure below shows a rectangle that has been divided into 5 different triangles, P, Q, R, S and T with their respective areas given in the figure. Find the area of R.



$$\begin{aligned}
 \text{Area of } \triangle T + \triangle Q + \triangle R &= \text{Area of } \triangle P + \triangle S \\
 22 + 52 + \text{Area of } \triangle R &= 88 + 46 \\
 \text{Area of } \triangle R &= 88 + 46 - 22 - 52 \\
 &= 60
 \end{aligned}$$

Ans : 60 cm²

7. The figure shows a square ABCD of 10cm side and a triangle CEF.
 The ratio of length DF to FC is 1:4.
 Find the difference between the 2 shaded areas.



$$10 \times 10 = 100$$

$$\frac{1}{2} \times 8 \times 10 = 40$$

$$100 - 40 = 60$$

Ans : 60 cm²