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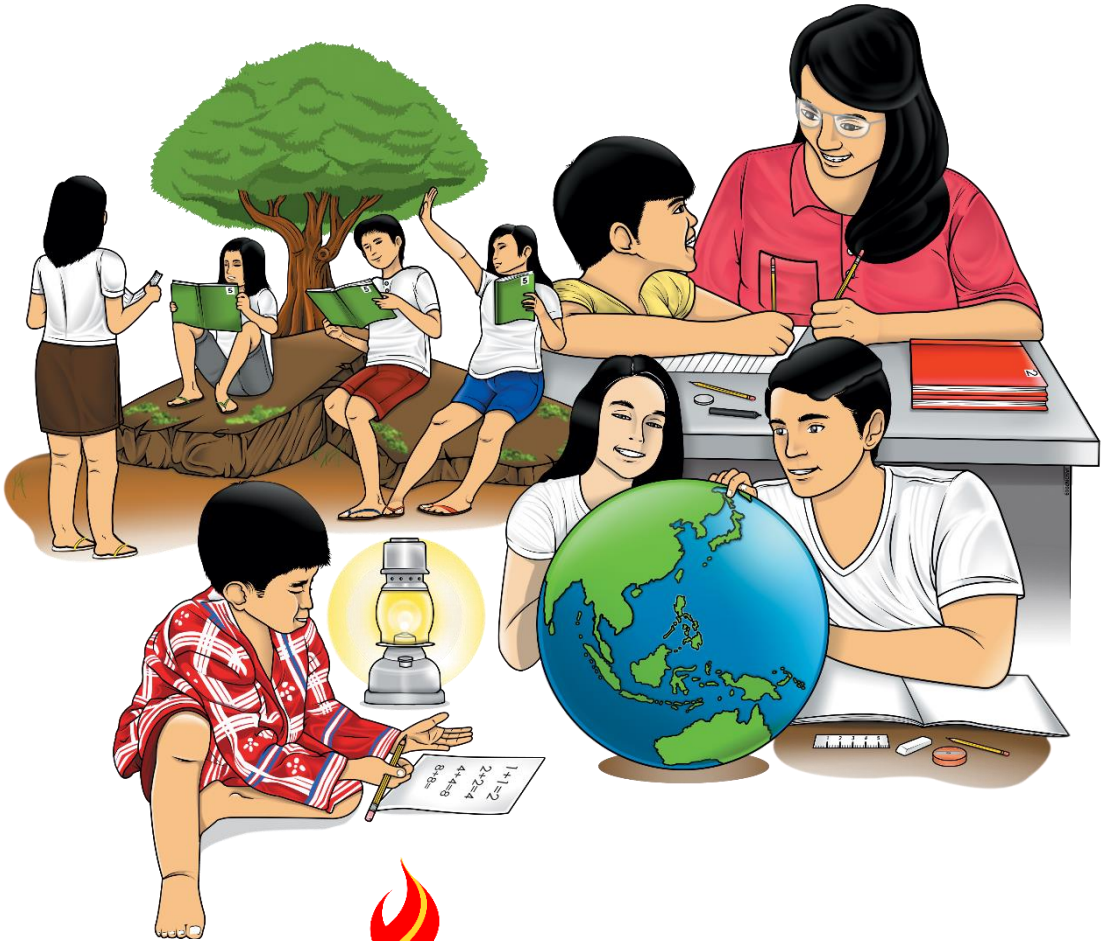
DEPARTMENT OF EDUCATION

Mathematics

Quarter 4 – Module 1: Finding the Areas of Irregular Figures



ALTERNATIVE DELIVERY MODE
ADM

Mathematics – Grade 4
Alternative Delivery Mode
Quarter 4 – Module 1: Finding the Areas of Irregular Figures
First Edition, 2020

Published by the Department of Education
Secretary: Leonor Magtolis Briones
Undersecretary: Diosdado M. San Antonio

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Printed in the Philippines by _____

Department of Education – Region V

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Mathematics

Quarter 4 – Module 1: Finding the Areas of Irregular Figures

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Introductory Message

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. And read the instructions carefully before performing each task.

If you have any questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Thank you.

What I Need to Know

It may seem easy to find the area of a plane figure like a rectangle or a square, but what if the figure has more than four sides or if it is irregular?

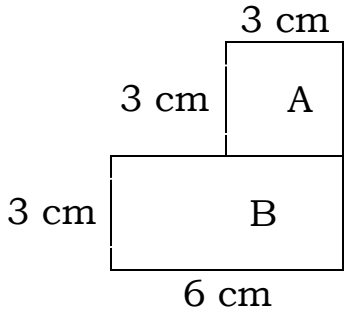
In this module, you will understand how to partition an irregular figure into squares and/or rectangles to find the area of the irregular figure.

After going through this module, you are expected to find the area of irregular figures made up of squares and rectangles using sq. cm and sq. m.

What I Know

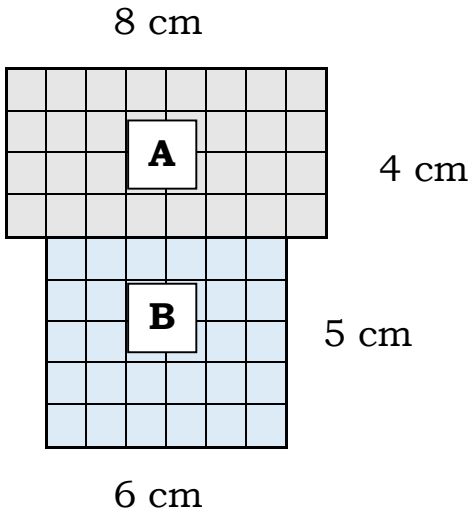
Analyze each diagram below and answer the questions that follow.

For questions 1 to 3, consider the figure below.



1. What is the area of square A?
2. What is the area of rectangle B?
3. What is the total area of figures A and B?

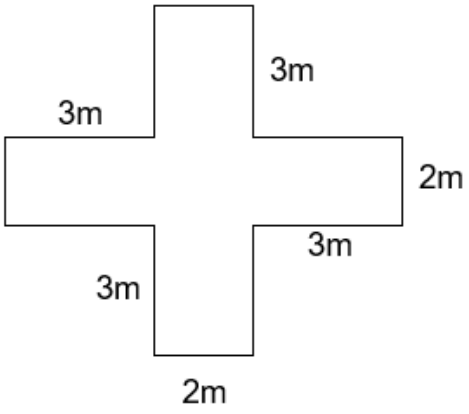
For questions 4 to 6, consider the figure below. Rectangle A is 8 cm long and 4 cm wide. Rectangle B is 6 cm long and 5 cm wide.



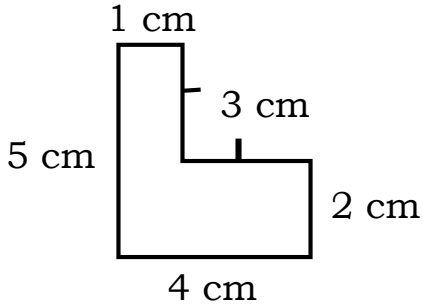
4. What is the area of rectangle A?
5. What is the area of rectangle B?
6. What is the total area of rectangles A and B?

Find the area of each irregular figure.
In each figure, identical markings are used to show that the sides are of equal length (congruent). Sides with the same number of markings are equal in length.

7)



8)



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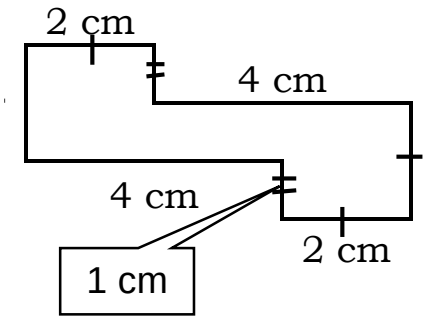

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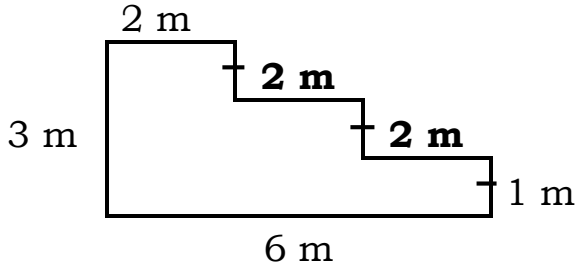


Are you done answering?
If yes, time to check. Please go to page 14 for the ***Answer Key***.

CONGRATULATIONS! If you got a score of 9 or 10, you should not have any difficulty studying the lesson in this module.

If you got a score of 8 or below, you may need to study the lesson more carefully and do all the given activities.

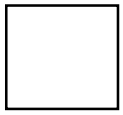
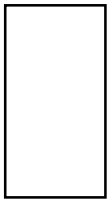
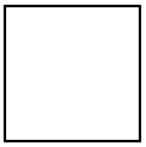
Lesson 1

Finding the Areas of Irregular Figures

What's In

Let's do this activity for a quick recall of finding the area of a square or a rectangle.

Match the square or rectangle in Column A to its area in Column B. Write the letter of the correct answer on your answer sheet.

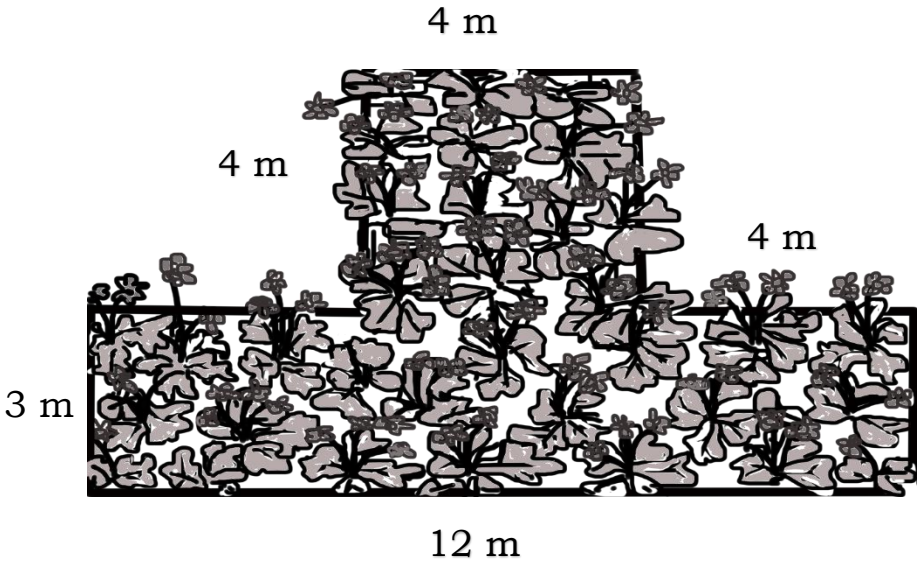
Column A	Column B
1.  10 cm	a. 16 cm^2
2. 12 m  7 m	b. 36 cm^2
3.  6 cm	c. 84 m^2
4. 2 cm  8 cm	d. 100 cm^2
5.  12 m	e. 120 cm^2
	f. 144 m^2

To find the area of a square, we use the formula:
$A = s \times s$
For the rectangle, we use the formula: $A = l \times w$

Are you done answering?
If yes, time to check. Please go to page 14 for the ***Answer Key***.

What's New

Neo and his younger sister Narlyn made a flower garden as shown below. They planted it with roses of different colors. Find the area of their garden.

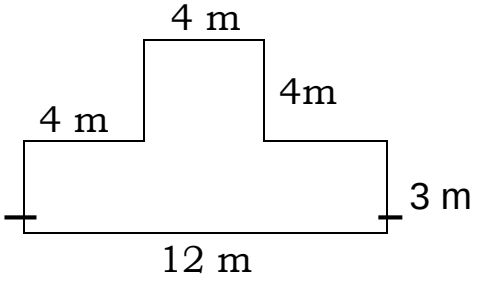


What can you say about the shape of their garden?

How will you find its area? In how many ways can you find its area?

What is It

Let's take a look at the shape of their garden. How can you break it up into rectangles and/or squares?



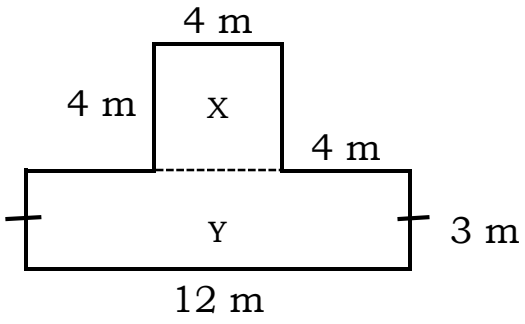
Let's find the area of the irregular figure following these steps.

Solution A. Using a Horizontal Cut

a. Draw a horizontal line to form a rectangle and a square.

The illustration below shows how it is done.

Two figures are formed: square **X** and rectangle **Y**.



b. Find the areas of the square and the rectangle.

Area of the square **X**
A = s x s
= 4 m x 4 m
= 16 m^2

Area of the rectangle **Y**
A = L x W
= 12 m x 3 m
= 36 m^2

c. Get the area of the irregular figure by adding the areas of the square and the rectangle.

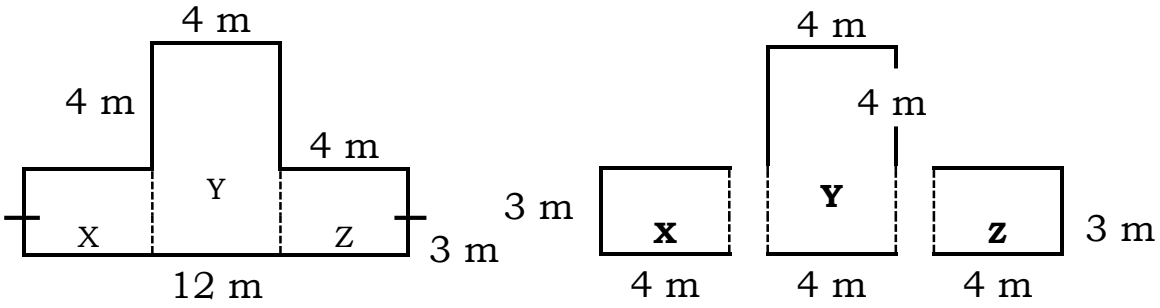
Total area of the irregular figure = area of **X** + area of **Y**
= 16 m^2 + 36 m^2
= 52 m^2

Therefore, the total area of their garden is 52 m^2.

Solution B: Using Vertical Cuts

a. Let's cut up the figure into three rectangles using vertical lines.

We have rectangle X, rectangle Y and rectangle Z.



b. Find the lengths and widths of the rectangles and solve for the area of each.

Area of rectangle X

A = L x W
= 4 m x 3 m
= **12 m²**

Area of rectangle Z

A = L x W
= 4 m x 3 m
= 12 m²

Area of rectangle Y

A = L x W
= 7 m x 4 m
= 28 m²

How did we get 7 m?
We added **4 m and 3 m**.

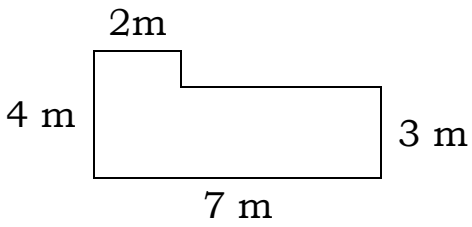
c. Then, add the areas of the three rectangles to get the area of the irregular figure.

Area of the irregular figure = **X** + **Y** + **Z**
= 12 m² + 28 m² + 12 m²
= 52 m²

Therefore, the total area of their garden is 52 m².

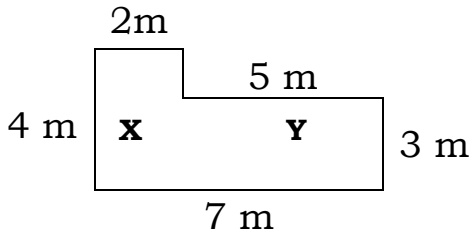
Let's try other examples.

1.



For the irregular figure above, how do you cut up the figure into rectangles and/or squares?

Consider this.



Two rectangles are formed: rectangle **X** and rectangle **Y**.

Area of rectangle **X**
A = l x w
= 2 m x 4 m
= 8 m²

Area of rectangle **Y**
A = l x w
= 5 m x 3 m
= **15 m²**

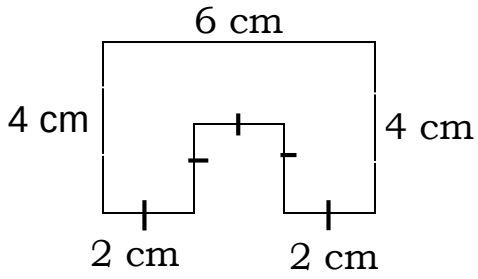
How did we get 5 m?
We subtracted **2 m** from **7 m.**

The sum of the areas of rectangles **X** and **Y** gives the area of the irregular figure.

Area = **X** + **Y**
= 8 m² + 15 m²
= 23 m²

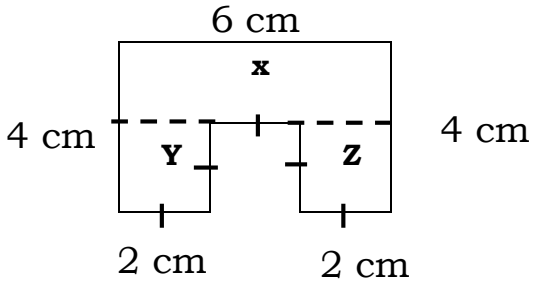
The area of the given irregular figure is 23 m².

2.



How can you break it up into rectangles and/or squares?

The rectangle formed is labelled X and the two squares formed are labelled Y and Z.



Area of square Y

A = s x s
= 2 cm x 2 cm
= 4 cm^2

Area of square Z

A = s x s
= 2 cm x 2 cm
= **4 cm^2**

Area of rectangle X

A = l x w
= 6 cm x 2 cm
= **12 cm^2**

How did we get 2 cm?
We subtracted 2 cm from 4 cm which is the original length.

Area of the irregular figure
= area of X + area of Y + area of Z
= 12 cm^2 + 4 cm^2 + 4 cm^2
= 20 cm^2

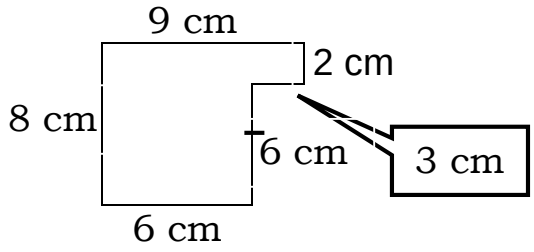
The area of the given irregular figure is 20 cm^2.

What's More

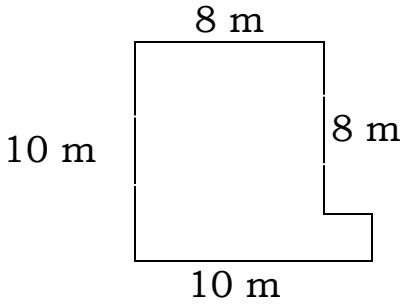
Let's have some practice.

Find the area of each irregular figure.

1



2.



Are you done answering?
If yes, time to check. Please go to page 14 for the ***Answer Key***.

What I Have Learned

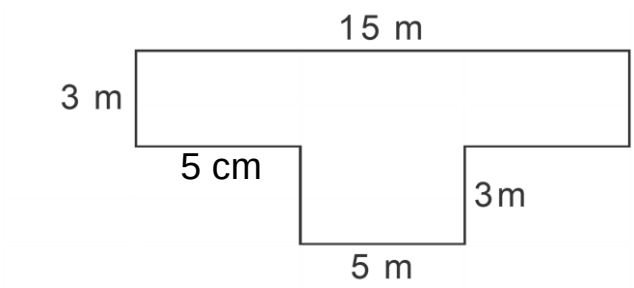
Let us summarize what you have learned:

To find the area of an irregular figure that is made up of squares and rectangles:

- First, break or cut the figure into squares and/or rectangles.
- Next, find the area of each square and/or rectangle.
- Then, add the areas of the squares and/or rectangles.

What I Can Do

Mr. Delgado is going to plant frog grass in their front yard as shown in the diagram. What is the area of the front yard that will be planted with frog grass?

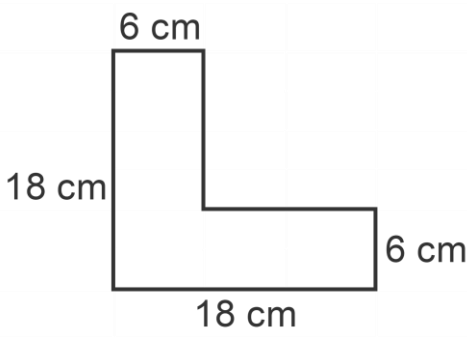


Are you done answering?
If yes, time to check. Please go to page 14 for the ***Answer Key***.

Assessment

Find the area of each irregular figure.

1.



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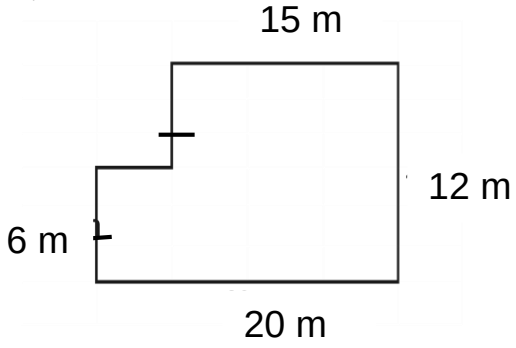

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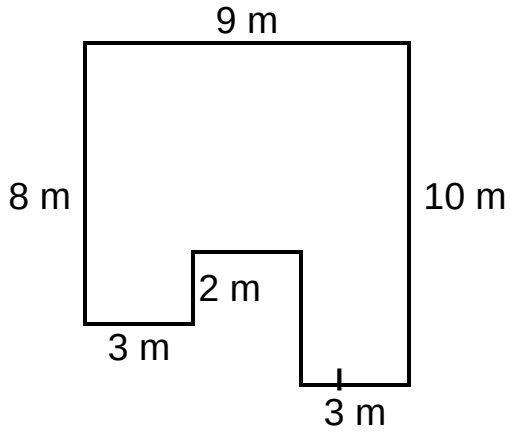
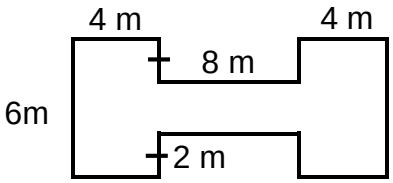
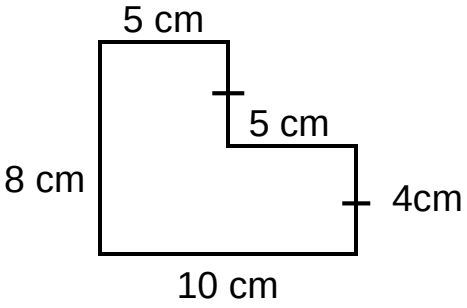

9 m
8 m
10 m
2 m
3 m
3 m

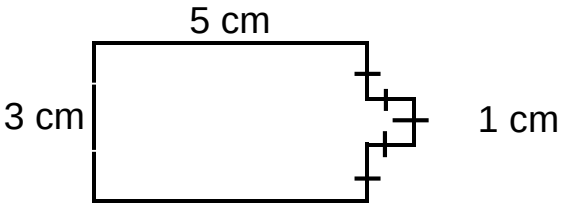
4.


4 m
4 m
8 m
6m
2 m

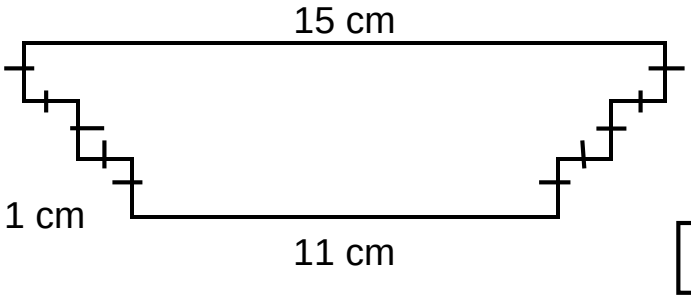
5.


5 cm
5 cm
8 cm
4cm
10 cm

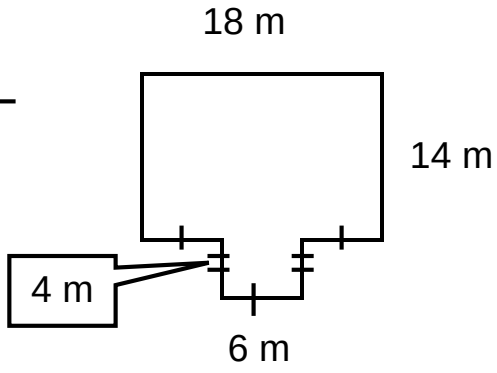
6.


5 cm
3 cm
1 cm

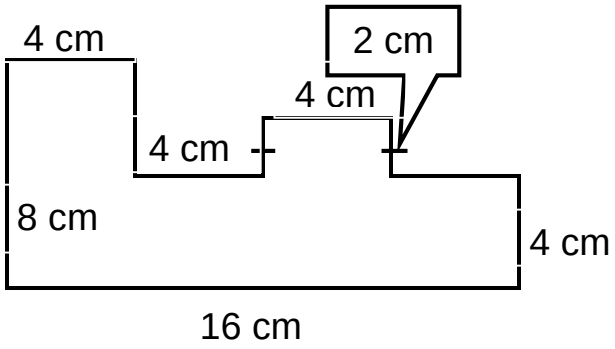
7.


15 cm
1 cm
11 cm

8.


18 m
14 m
4 m
6 m

9.



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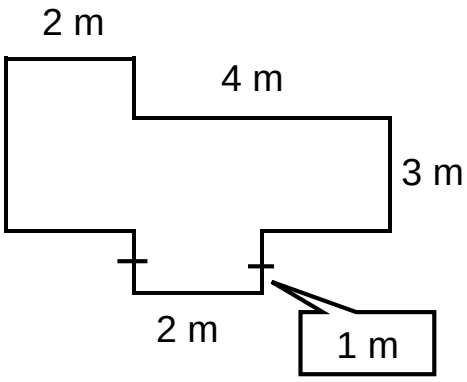
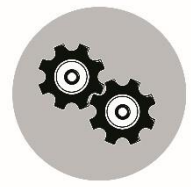


Are you done answering?
If yes, time to check. Please go to page 14 for the ***Answer Key***.

Got a score of 8 -10? EXCELLENT! You already understood the lesson. You are now ready for the next module.

If your score is below 8, kindly study again the lesson and the activities.



Additional Activities

Mr. De la Cruz constructed an infinity pool which measures 15 meters long and 6 meters wide. He decided to attach to its shorter side, a square pool with a side of 4 meters. Find the area occupied by the entire pool.

Are you done answering?
If yes, time to check. Please go to page 14 for the ***Answer Key***.

Answer Key

What's More

1. 54 cm^2
2. 84 m^2

What's In

1. d
2. c
3. b
4. a
5. f

What I Know

1. 9 cm^2
2. 18 cm^2
3. 27 cm^2
4. 32 cm^2
5. 30 cm^2
6. 62 cm^2
7. 28 m^2
8. 11 cm^2
9. 10 cm^2
10. 12 m^2

Additional Activities

The area occupied by the entire pool is 106 m^2.

Assessment

1. 180 cm^2
2. 210 m^2
3. 72 m^2
4. 64 m^2
5. 60 cm^2
6. 16 cm^2
7. 39 cm^2
8. 276 m^2
9. 88 cm^2
10. 16 m^2

What I Can Do

The area of the front yard is 60 m^2.

References

DepEd Order No. 12, s. 2020.Adoption of the Basic Education Learning Continuity Plan for SY 2020-2021 In Light of the Covid-19 Public Health Emergency. June 19, 2020. p. 342.

Tabilang, Alma R., Arce, Ian Jay B., Pascua, Rodrigo V., Calayag, Nelma P., Dacubo, Lolita p., Borais, Diolata B., Buemia, Rafael B., collao, Myra T., Morandante, Larry G., Danao, Amado B., Gonzaga, Laura N., Briones, Isagani A., Daganta, John Antonio D., 2015, **Mathematics 4 Learner's Material**, Department of Education

Tabilang, Alma R., Arce, Ian Jay B., Pascua, Rodrigo V., Calayag, Nelma P., Dacubo, Lolita p., Borais, Diolata B., Buemia, Rafael B., collao, Myra T., Morandante, Larry G., Danao, Amado B., Gonzaga, Laura N., Briones, Isagani A., Daganta, John Antonio D., 2015, **Mathematics 4 Teacher's Guide**, Department of Education.

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