



Make Some Space For Me! (Area)

Suggested time: 45 minutes

What's important in this lesson:

It is important for you to understand the concept of area and be able to correctly use the area formula. You will need to be careful to convert fractions to their decimal equivalents and use the correct units of measurement. You will need to learn how to apply the area formula to irregular shapes and how to show your solutions clearly.

Complete these steps:

1. Read through the Lesson portion of the package independently.
2. Complete the required 'Practice' questions.
3. If you have questions about the examples or the 'Practice' questions seek assistance from the teacher as needed.
4. Use 'Practice' Answer Keys to check your answers as they work through the package. If you are making errors, have your teacher review these questions with you.
5. Complete the Area Assignment.

Hand-in the following to your teacher:

1. Practice Problems from the Student Handout
2. Area Assignment

Questions for the teacher:



Make Some Space for Me! (AREA)

So far, you have used mm, cm, m, km, in, and ft to study LENGTH (or distance).

We will now examine how much SURFACE something has (a.k.a., AREA).

Part A - The RECTANGLE

Recall that the formula for the AREA of a RECTANGLE is

$$A = L \times W$$

Where **L** is the LENGTH of the rectangle and **W** is the width of the rectangle.

The UNITS for area will always be the SQUARE of the units used to measure these distances.

For Example:

When a rectangle is measured in metres, the AREA will have the units, **m²**

When a rectangle is measured in centimetres, the AREA will have the units, **cm²**

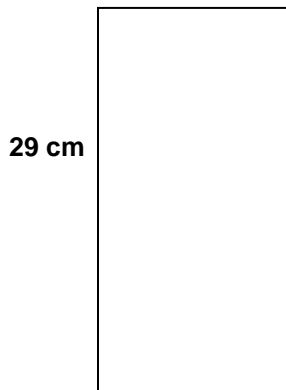
When a rectangle is measured in feet, the AREA will have the units, **square feet (ft²)**

etc...

Examples

1. CALCULATE the area of the rectangles below:

a. 13 cm



$$\begin{aligned} A &= L \times W \\ &= 29\text{cm} \times 13\text{cm} \\ &= \underline{\underline{377\text{cm}^2}} \end{aligned}$$

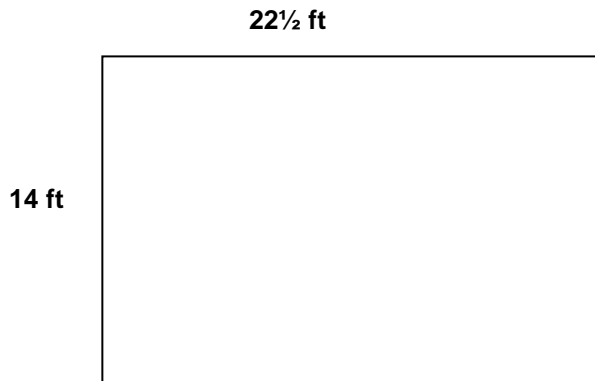
Does it matter which number (29 or 13) is the LENGTH and which one is the WIDTH?

NOT REALLY – although the LENGTH is usually the LARGER number!

Why do you think it doesn't "REALLY" matter?



b)



$$\begin{aligned}
 A &= L \times W \\
 &= 22.5 \text{ ft} \times 14 \text{ ft} \\
 &\text{(notice that the } 22\frac{1}{2} \text{ became } 22.5!) \\
 &= 315 \text{ sq ft (or ft}^2\text{)}
 \end{aligned}$$

Part B - Using AREA

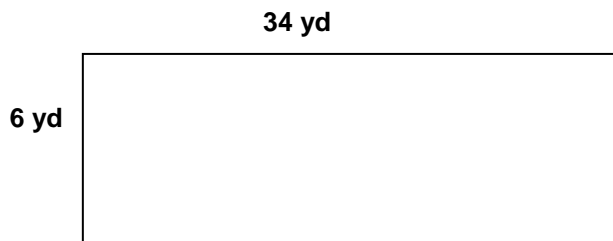
Knowing how to calculate AREA is useful if we ever need to find the area of...

- the floor of a room (to install carpet, tile, etc.)
- a wall (to be painted, wallpapered, etc.)
- our yard (to be covered in grass, or a deck, or concrete, etc.)

Examples

Work through the following examples.

1. A driveway that is 6 yards wide and 34 yards long needs to be resurfaced with concrete. In order to determine how much concrete to use, the owner needs to calculate the area of the driveway.

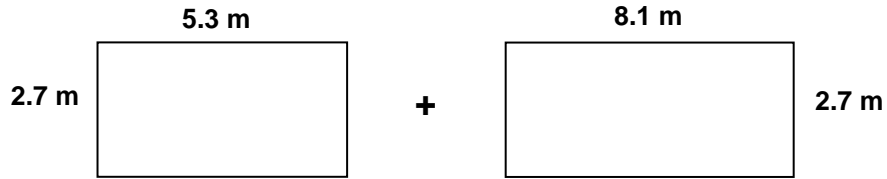


$$\begin{aligned}
 A &= L \times W \\
 &= \underline{\hspace{2cm}} \text{ yd} \times \underline{\hspace{2cm}} \text{ yd} \\
 &= \underline{\hspace{3cm}} \text{ sq yds}
 \end{aligned}$$

Therefore, the area of the driveway is _____ square yards.



2. A painter needs to figure out if he has enough paint to paint 2 walls in a room. The walls are 5.3m long and 8.1m long. The height of the room is 2.7m. Find the total area of the 2 walls.



Total AREA = A (wall 1) + A (wall 2)

Wall 1
 $A = L \times W$
 $= 5.3\text{m} \times 2.7\text{m}$
 $= \underline{\hspace{2cm}} \text{m}^2$

Wall 2
 $A = L \times W$
 $= 8.1\text{m} \times 2.7\text{m}$
 $= \underline{\hspace{2cm}} \text{m}^2$

so, the TOTAL AREA = A1 + A2

$= \underline{\hspace{2cm}} \text{m}^2 + \underline{\hspace{2cm}} \text{m}^2$
 $= \underline{\hspace{2cm}} \text{m}^2$

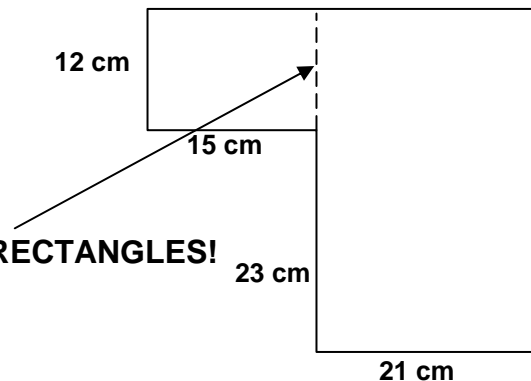
*** Check the answers to these questions before moving on to part C!**

Part C - Are These Rectangles?

Sometimes, the shapes (or rooms) that we need to find the area of are not exactly RECTANGLES!

Example

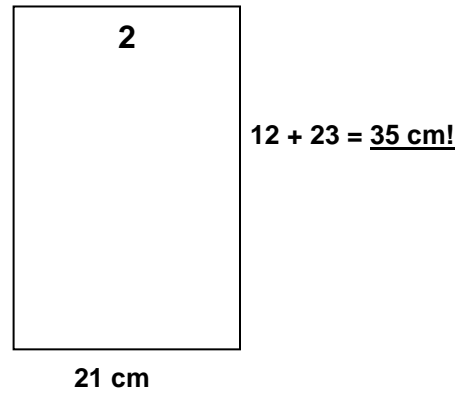
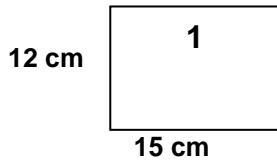
1. Find the area of the shape on the right.



This shape is not a RECTANGLE,
BUT it can easily be SPLIT UP into 2 RECTANGLES!
(see the next page)



The challenge is to USE THE CORRECT MEASUREMENTS:



now, TOTAL AREA = A1 + A2

$$A1 = L \times W \\ = 15\text{cm} \times 12\text{cm}$$

and

$$A2 = L \times W \\ = 35\text{cm} \times 21\text{cm}$$

$$= \underline{\hspace{2cm}} \text{cm}^2$$

$$= \underline{\hspace{2cm}} \text{cm}^2$$

so, TOTAL AREA = $\underline{\hspace{2cm}}$ + $\underline{\hspace{2cm}}$

$$= \underline{\hspace{2cm}} \text{cm}^2$$

Practice Problems

1. ESTIMATE the answers to the following questions by circling the BEST response:
 - a. The area of the front cover of a math textbook is closest to...

A) 5cm² B) 500cm² C) 5m D) 5 sq ft E) 500 sq yds
 - b. The area of a small 1-bedroom apartment is likely...

A) 800cm² B) 800m² C) 800km² D) 800sq ft E) 800sq yds
 - c. The area of the surface of a package of gum is likely...

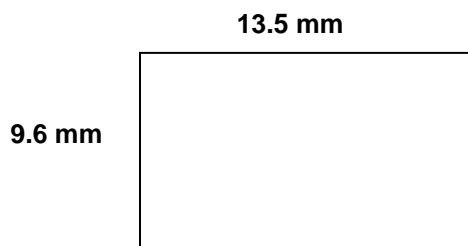
A) 0.4cm² B) 4 cm² C) 40cm² D) 400cm² E) 4m²



For the following questions:

- Show all your work!
- Use proper units

2. Find the area of the rectangle.



3. MEASURE the rectangle below (to the nearest tenth of a cm) and then CALCULATE the area.

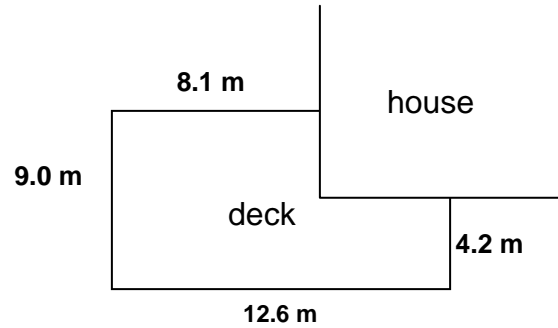


4. A floor needs to be covered with new wood. The dimensions of the room are 14ft by 19ft. Find the area of the floor. Include a sketch with the correct dimensions on it.

Student Handout: Unit 3 Lesson 5



5. A deck is to be built around the corner of a house, as shown in the diagram. Find the total area of the deck.



Check these answers before moving on!



Area Assignment

1. Name 3 things in your classroom that have an area between 10cm^2 and 100cm^2 .
2. Name 3 things in your classroom that have an area between 100cm^2 and 1m^2 .
3. Sketch and calculate the area of a wall with a length of 7.9m and a height of 2.8m .
4. Measure the length and width of this page (**in millimetres**) and then calculate its area.
5. Calculate the area of the pig pen from Lesson #2 (Unit 3):

