

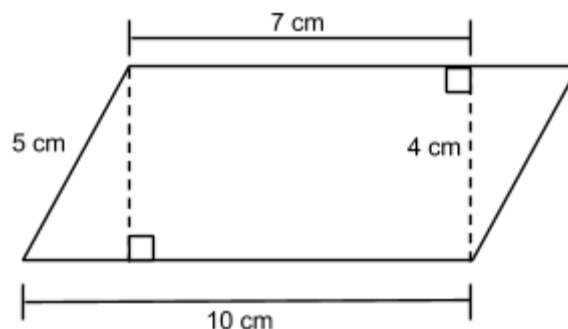
## Lesson 1.5.3: Area of Quadrilaterals

### Targets:

1. I understand how to find the formulas for the area of parallelograms, kites, and trapezoids.
2. I understand how to find the area of parallelograms, kites, and trapezoids.

### Warm Up:

Use what you know about the area of a triangle and the area of a rectangle to find the area of the parallelogram.



### Definition of Parallelogram

A 4-sided flat shape with straight sides where **opposite sides are parallel**.

NOTE: Squares, Rectangles and Rhombuses are all Parallelograms!

### Explore: Area of a Parallelogram

Your goal is to cut a parallelogram so that you can turn it into a rectangle.

- 1.) Ask Mr. Eoff for a copy of the parallelogram from the warm up.
- 2.) Cut out the parallelogram.
- 3.) Make one cut into the parallelogram so that it is now two pieces. (You choose what cut to make).
- 4.) See if you can now make the parallelogram into a rectangle by combining your two pieces.
- 5.) What are the dimensions of your new shape? Calculate the area of your new "rectangle." Is it the same as the area of the parallelogram from the warm up?
- 6.) Write a formula for the area of a parallelogram. (add this to your formula sheet)

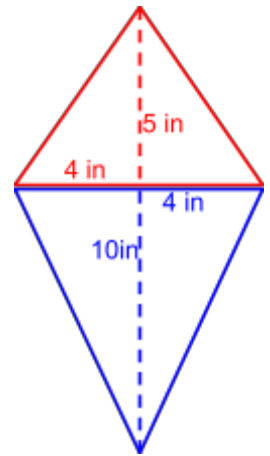
## Review: What is a Kite?

Do you remember the definition of a kite? It is a quadrilateral with two distinct pairs of equal adjacent sides.

Follow this link to play with some kites: <http://www.mathopenref.com/kite.html>

## Explore: Area of a Kite

- 1.) Find the area of the kite using what you already know.
- 2.) Sketch a rectangle around the kite so that the angles of the kite touch each side of the rectangle.
- 3.) What are the dimensions of your rectangle?
- 4.) Find the area of the rectangle.
- 5.) Compare the area of the kite to the area of the rectangle.
- 6.) Write a formula for the area of a kite. (add it to your formula sheet).



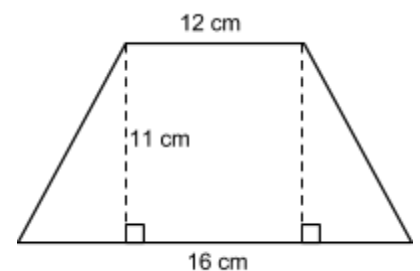
## Review: What is a Trapezoid?

Do you remember the definition of a trapezoid? It is a quadrilateral which has at least one pair of parallel sides.

Follow this link to play with some trapezoids: <http://www.mathopenref.com/trapezoid.html>

## Explore: Area of a Trapezoid

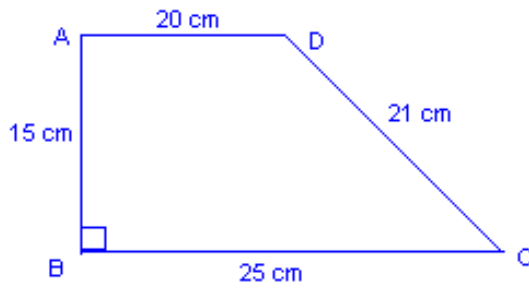
- 1.) Find the area of the trapezoid using what you already know.
- 2.) Ask Mr. Eoff for a printout of the trapezoid.
- 3.) Cut out one of the triangles and try to turn the trapezoid into a rectangle.
- 4.) What are the dimensions of the new rectangle?
- 5.) Write a formula for the area of a trapezoid by combining the area of the rectangle within the trapezoid and the triangles within the trapezoid. Call the two parallel sides of the trapezoid “base 1” and “base 2”.
- 6.) Can you use your algebra skills to simplify the formula?



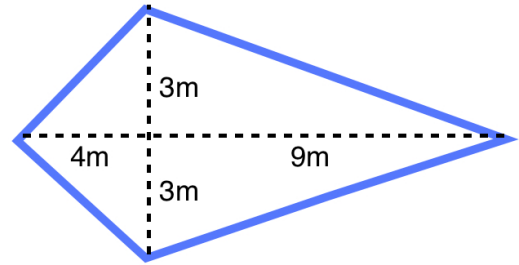
## Practice Problems

Use your new formulas to find the area of each figure.

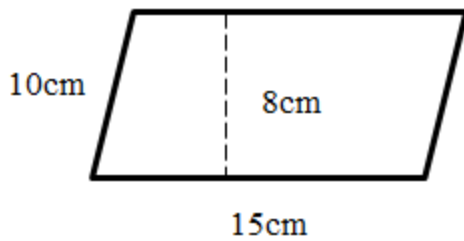
1.)



2.)



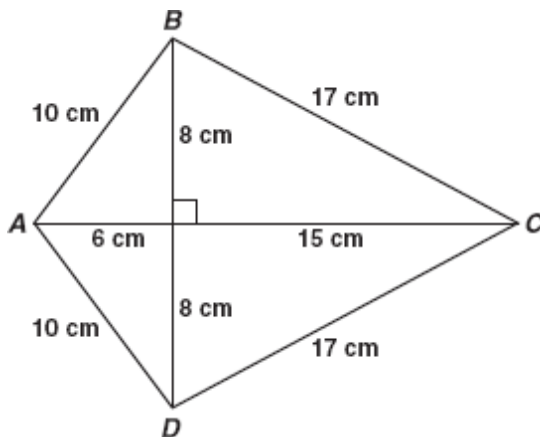
3.)



## Exit Ticket

1. Explain how the area of a kite compares to the area of a rectangle.
2. Explain why part of the formula for the area of a trapezoid is adding the two bases and dividing by 2.
3. Find the area of the following figures.

a.



b.

