CHAPTER 9

Family Letter

Section A

What We Are Learning

Perimeter and Area

Vocabulary

These are the math words we are learning:

area the number of square units in a figure

base a side of a polygon

composite figure a figure made up of basic geometric shapes

height the perpendicular distance from the base to the opposite side or vertex of a polygon

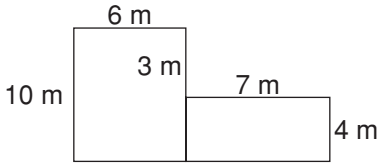
perimeter the distance around the outside of a figure

Dear Family,

The student will be learning to find the perimeter and the area of polygons. **Perimeter** is the distance around a polygon. **Area** is defined as the number of square units in a figure.

In parallelograms, a simple formula is used to calculate the area: *Area* equals the *base length* times the *height* or $A = bh$.

Find the area and the perimeter of the figure.



The length of the side that is not labeled is the same as the length of the opposite side.

$p = 10 + 6 + 3 + 7 + 4 + 7 + 6 = 43$ m

$A = (10 \cdot 6) + (7 \cdot 4)$ Add the areas together.

$A = 60 + 28$

$A = 88$ m^2

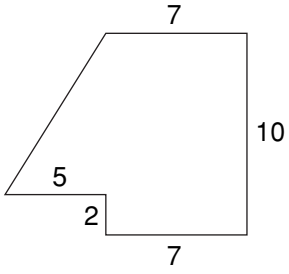
The perimeter is 43 m, and the area is 88 m^2.

The student will need to learn the area formulas for other polygons, like a triangle and a trapezoid to calculate the area of a polygon that can be separated into parallelograms, triangles, and trapezoids.

Area Formulas for Triangles and Trapezoids		
	Words	**Formula**
Triangle	Area equals one-half the base times the height.	$A = \frac{1}{2} bh$
Trapezoid	Area equals one-half the sum of the bases times the height.	$A = \frac{1}{2} h(b_1 + b_2)$

Find the area of the figure.

The figure is made up of a rectangle and a triangle, so first find the areas of each of these figures, and then add them together to find the total area.



Area of rectangle:

$A = bh$
$= 7 \cdot 10$
$= 70 \text{ units}^2$

Area of triangle:

$A = \frac{1}{2}bh$
$= \frac{1}{2} \cdot 5 \cdot 8$
$= 20 \text{ units}^2$

Area of entire figure:
A = Area of rectangle + Area of triangle
$= 70 \text{ units}^2 + 20 \text{ units}^2$
$= 90 \text{ units}^2$

The area of the figure is 90 square units.

The student will need a firm grasp of the concepts in this section, as they provide the foundation for the next chapter.

Sincerely,

CHAPTER 9

Family Letter

Section B

What We Are Learning

Circles

Vocabulary

These are the math words we are learning:

arc an unbroken part of a circle named for its endpoints

central angle an angle within a circle formed by two radii

chord a line segment with its endpoints on a circle

circle the set of all points in a plane that are the same distance from a given point called the center

circumference the distance around a circle

diameter a chord that passes through the center of a circle

radius a line segment with one endpoint at the center of a circle and the other endpoint on the circle

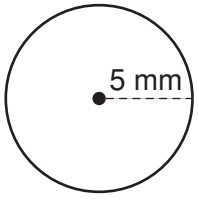
sector part of a circle formed by two radii and the arc connecting them

Dear Family,

In this section, the student will learn about circles. A **circle** is made up of all of the points in a plane that are the same distance from a given point, which is called the **center of the circle.**

As he or she did with polygons, the student will find the distance around a circle, which is called the circle's **circumference,** and the area of a circle. In finding these measures, the student will discover relationships between a circle's **radius, diameter,** and the irrational number π.

Find the circumference and the area of the circle, both in terms of π and to the nearest tenth. Use 3.14 for π.



Circumference:

$C = 2\pi r$
$= 2 \cdot \pi \cdot 5$
$= 10\pi$
$\approx 10 \cdot 3.14$
≈ 31.4

The circumference is 10π mm, or approximately 31.4 mm.

Area:

$A = \pi r^2$
$= \pi \cdot (5)^2$
$= 25\pi$
$\approx 25 \cdot 3.14$
≈ 78.5

The area is 25π mm^2, or approximately 78.5 mm^2.

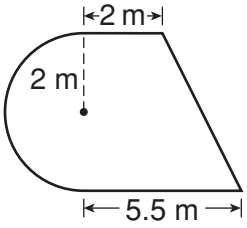
Family Letter

Section B continued

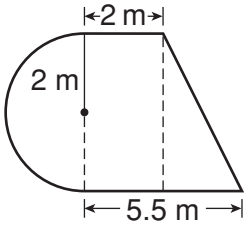
The student will combine his or her knowledge about polygons and circles to find the areas of composite and irregular figures. As the students learned in the first section of this chapter, a composite figure is made up of basic geometric shapes.

Irregular figures often have natural or organic boundaries. The state of California is a good example of an irregular figure. Part of its border is determined by imaginary lines on a map. The rest of the border, such as the Pacific coastline, though, is determined by a natural geographic feature. The areas of irregular figures can be estimated by placing the figures on grids, or by using composite figures to approximate the sizes and shapes of the irregular figures.

Find the area of the composite figure. Use 3.14 for π.



The figure is made up of a semicircle, a rectangle, and a triangle. The diameter of the semicircle is the same as the heights of the rectangle and of the triangle. Find the area of each figure, and then add them together to find the area of the composite figure.



Semicircle:

$A = \frac{1}{2}\pi r^2$

$\approx \frac{1}{2} \cdot 3.14 \cdot (2)^2$

≈ 6.28

Rectangle:

$A = bh$

$= 2 \cdot 2$

$= 4$

Triangle:

$A = \frac{1}{2}bh$

$= \frac{1}{2} \cdot 3.5 \cdot 4$

$= 7$

Composite Figure:

$A \approx 6.28 + 4 + 7$

≈ 17.28

The area of the figure is approximately 17.28 m^2.

Please make sure the student understands the concepts in this chapter. They will be used again in the next chapter, and in future mathematics courses.

Sincerely,