



Sixth Grade Math

This packet includes four sections that cover the major content of 6th grade math. Each section includes four pages of notes and practice for each topic. For additional support, visit KCS TV on YouTube for instructional videos that accompany each section.

The following content is included in this packet:

	Topic			
	I. Area of Polygons	II. Ratio Reasoning	III. Rational Numbers	IV. Equations and Expressions
Activity 1	Area of Quadrilaterals	Rates	Dividing Mixed Numbers	Order of Operations
Activity 2	Area of Triangles	Ratios, Rates, Tables, and Graphs	Adding and Subtracting Decimals	Addition and Subtraction Equations
Activity 3	Solving Area Problems	Solving Problems with Proportions	Multiply Decimals	Evaluating Expressions
Activity 4	Area of Polygons	Understanding Percent	Dividing Decimals	Generating Equivalent Expressions

Section I Area of Quadrilaterals

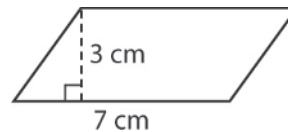
Activity 1

You can use formulas to find the areas of quadrilaterals.

The area A of a **parallelogram** is the product of its base b and its height h .

$$A = bh$$

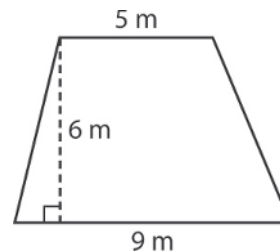
$$\begin{aligned} A &= bh \\ &= 3 \cdot 7 \\ &= 21 \text{ cm}^2 \end{aligned}$$



The area of a **trapezoid** is half its height multiplied by the sum of the lengths of its two bases.

$$A = \frac{1}{2}h(b_1 + b_2)$$

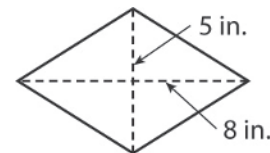
$$\begin{aligned} A &= \frac{1}{2}h(b_1 + b_2) \\ &= \frac{1}{2} \cdot 6(5 + 9) \\ &= \frac{1}{2} \cdot 6(14) \\ &= 3 \cdot 14 \\ &= 42 \text{ m}^2 \end{aligned}$$



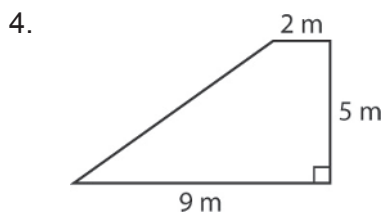
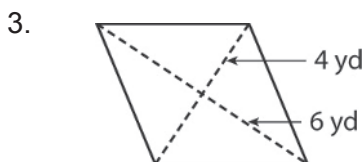
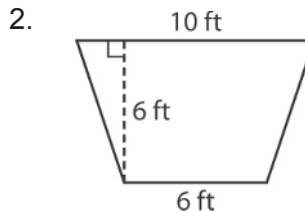
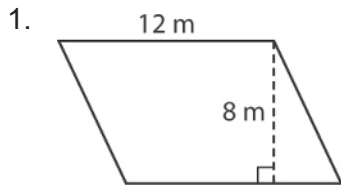
The area of a **rhombus** is half of the product of its two diagonals.

$$A = \frac{1}{2}d_1d_2$$

$$\begin{aligned} A &= \frac{1}{2}d_1d_2 \\ &= \frac{1}{2}(5)(8) \\ &= 20 \text{ in}^2 \end{aligned}$$

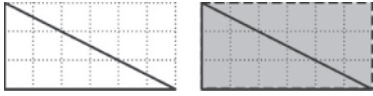


Find the area of each figure.



Section I
Activity 2 **Area of Triangles**

To find the area of a triangle, first turn your triangle into a rectangle.



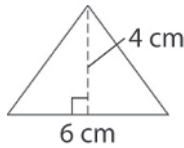
Next, find the area of the rectangle. $6 \cdot 3 = 18$ square units

The triangle is half the area of the formed rectangle or $A = \frac{1}{2}bh$, so divide the product by 2.

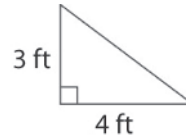
$18 \div 2 = 9$ So, the area of the triangle is 9 square units.

Find the area of each triangle.

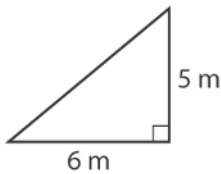
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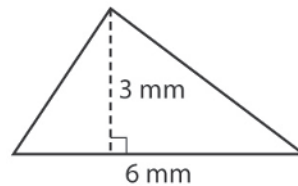
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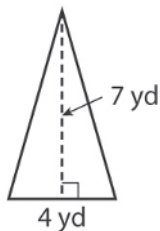
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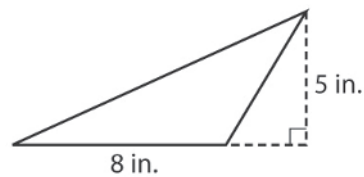
4.



5.



6.



Section I Solving Area Equations
Activity 3

You can use area formulas to find missing dimensions in figures.

The formula for area of a parallelogram is $A = bh$.

The formula for area of a trapezoid is $A = \frac{1}{2}h(b_1 + b_2)$.

The formula for area of a rhombus is $A = \frac{1}{2}d_1d_2$.

The formula for area of a triangle is $A = \frac{1}{2}bh$.

Suppose you know the area of a triangle is 28 square feet. You also know the length of the base of the triangle is 7 feet. What is the height of the triangle?

Use the formula for area of a triangle. $A = \frac{1}{2}bh$

Substitute known values. $28 = \frac{1}{2}(7)h$

Multiply both sides by 2. $56 = 7h$

Divide both sides by 7. $8 = h$

The height of the triangle is 8 feet.

Solve.

1. The area of a parallelogram is 150 square meters. The height of the parallelogram is 15 meters. What is the length of the parallelogram?

2. The length of one diagonal of a rhombus is 8 cm. The area of the rhombus is 72 square centimeters. What is the length of the other diagonal of the rhombus?

3. The area of a triangle is 32 square inches. The height of the triangle is 8 inches. What is the length of the base of the triangle?

4. The area of a rectangle is 34 square yards. The length of the rectangle is 17 yards. What is the width of the rectangle?

5. The area of a trapezoid is 39 square millimeters. The height of the trapezoid is 6 millimeters. One of the base lengths of the trapezoid is 5 millimeters. What is the length of the other base of the trapezoid?

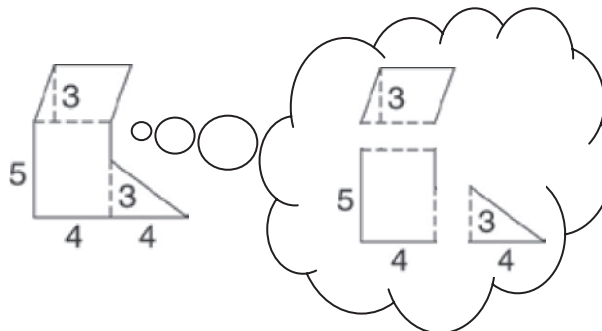
Section I Area of Polygons

Activity 4

Sometimes you can use area formulas you know to help you find the area of more complex figures.

You can break a polygon into shapes that you know. Then use those shapes to find the area.

The figure at right is made up of a triangle, a parallelogram, and a rectangle.



Triangle

$$\begin{aligned}
 A &= \frac{1}{2}bh \\
 &= \frac{1}{2}(3 \times 4) \\
 &= 6 \text{ square units}
 \end{aligned}$$

Parallelogram

$$\begin{aligned}
 A &= bh \\
 &= 3 \times 4 \\
 &= 12 \text{ square units}
 \end{aligned}$$

Rectangle

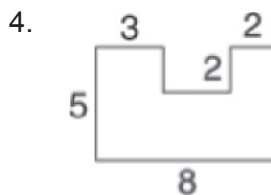
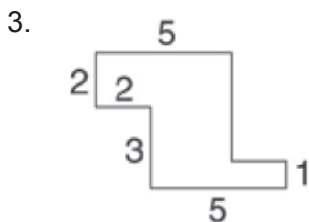
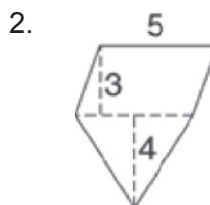
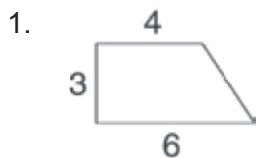
$$\begin{aligned}
 A &= lw \\
 &= 4 \times 5 \\
 &= 20 \text{ square units}
 \end{aligned}$$

Finally, find the sum of all three areas.

$$6 + 12 + 20 = 38$$

The area of the whole figure is 38 square units.

Find the area of each figure.



Answer Key

I. Area of Polygons

Activity 1: Area of Quadrilaterals

- | | |
|----------------------|-----------------------|
| 1. 96 m^2 | 3. 12 yd^2 |
| 2. 48 ft^2 | 4. 27.5 m^2 |

Activity 2: Area of Triangles

1. 12 cm^2
2. 6 ft^2
3. 15 m^2
4. 9 mm^2
5. 14 yd^2
6. 20 in^2

Activity 3: Solving Area Problems

1. 10 m
2. 18 cm
3. 8 in.
4. 2 yd
5. 8 mm

Activity 4: Area of Polygons

1. 15 square units
2. 25 square units
3. 21 square units
4. 34 square units