Area of Quadrilaterals and Triangles

Perimeter: the distance around the outside of a figure

Area: amount of surface a figure covers.

Example:

5 cm

3 cm

**This rectangle covers 15 square cm, or 15 cm²

Quadrilateral: a four sided closed figure (polygon).

Triangle: a three sided closed figure (polygon).

Parallelogram: a four sided figure with exactly two pairs of parallel sides. The opposite sides of a parallogram must be congruent.

Square inches (in²): the label used to describe area of a figure measured in inches. A square inch is a square whose sides measure one inch.

Square cm (cm²): the label used to describe area of a figure measured in centimeters. A square centimeter is a square whose sides measure one cm.

Square unit (unit²): the label used to describe area of a figure measured without a label.

For example:

4 u

3 u

$3 \cdot 4 = 12$ units²

Length/Base: the distance across the bottom of a two-dimensional figure

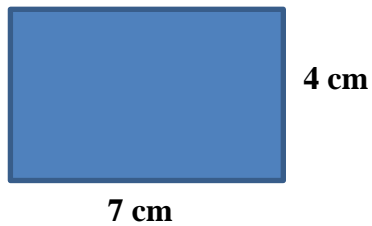**Width/Height:** the distance across the side of a two-dimensional figure.

Right Angle: an angle like the corner of an index card; it measures 90°

To solve for area of a square, rectangle, or parallelogram, use the formula:

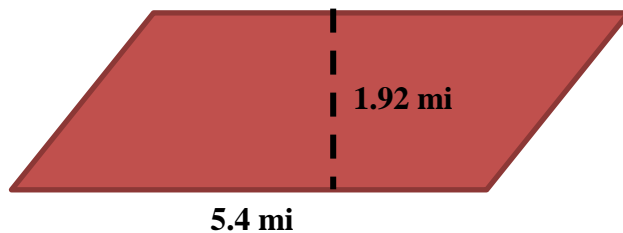$$A = l \times w \quad \text{or} \quad A = b \times h$$
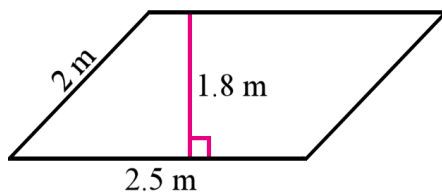
<u>Examples:</u>

1)

4 cm

7 cm

$A = l \cdot w$
$A = 7 \text{ cm} \cdot 4 \text{ cm}$
$A = 28 \text{ cm}^2$

2)

1.92 mi

5.4 mi

$A = b \times h$
$A = 5.4 \text{ mi} \cdot 1.92 \text{ mi}$
$A = 10.368$ (round to hundredths')
$A = 10.37 \text{ mi}^2$

3)

2 m

1.8 m

2.5 m

$A = l \cdot w$
$A = 2.5 \text{ m} \cdot 1.8 \text{ m}$
$A = 4.5 \text{ m}^2$

NOTE: The height is 1.8, not 2! 2 is the diagonal side length.

** Use the following formula to calculate area of a triangle:

$$A = \tfrac{1}{2}(b \times h) \quad \text{or} \quad A = (b \times h) \div 2$$
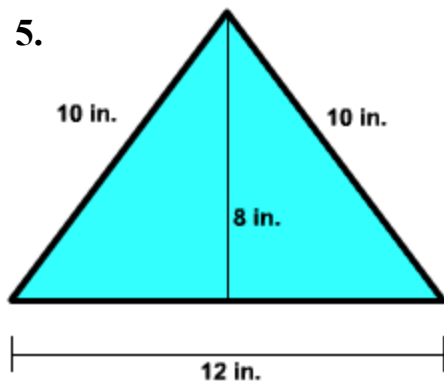
4)

9.6 u

6.2 u
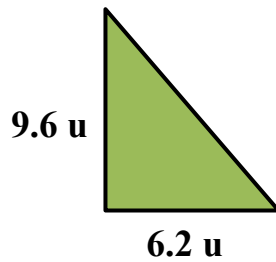
$A = b \cdot h \div 2$

$A = (9.6\ u \cdot 6.2\ u) \div 2$

$A = 30.72 \div 2$

$A = 15.36\ u^2$

5.

10 in.   10 in.

8 in.

12 in.

$A = \tfrac{1}{2}\ b \cdot h$

$A = \tfrac{1}{2}\ (12\ \text{in} \cdot 8\ \text{in})$

$A = \tfrac{1}{2} \cdot 96\ \text{in}^2$

$A = 48\ \text{in}^2$

NOTE: The height is 8 in, not 10! 10 is the diagonal side length.

Find missing dimension of each quadrilateral:

6) A = 56 mm²
    l = 7 mm
    w = _____

7) A = 176 km²
    b = _____
    h = 16 km

Solve for Area:
- **Write each formula**
- **Sub in known values**
- **Solve for unknown value**

8)

13

5

12

9) **Careful, OTTERS!**

10 in

8 in

1 ft