

Topic 12-1 Area of Rectangles

★ Area - the amount of surface a figure covers.

★ Formula:

$$\text{Area} = l \cdot w, l \times w, \text{ or length} \times \text{width}$$

1.

A rectangle with a horizontal top edge labeled "5 ft" and a vertical right edge labeled "4 ft".

$$A = l \times w$$
$$A = 5 \times 4$$
$$A = 20 \text{ ft}^2$$

"20 square feet"

2.

A rectangle with a horizontal top edge labeled "12 ft" and a vertical right edge labeled "3 ft".

$$A = l \times w$$
$$A = 12 \times 3$$
$$A = 36 \text{ ft}^2$$

3.

A rectangle with a horizontal bottom edge labeled "l" and a vertical right edge labeled "8 cm".

$$A = l \times w$$
$$120 = l \times 8$$
$$\div 8 \quad \div 8 \quad * \text{Inverse Operation}$$

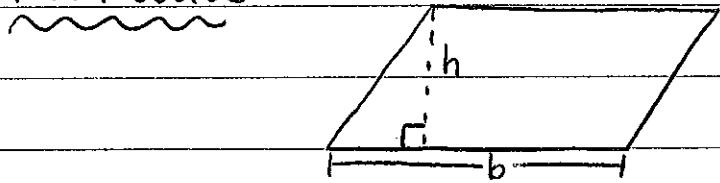
$$120 \div 8 = l$$

$$15 \text{ cm} = l$$

$$\begin{array}{r} 15 \\ 8) 120 \\ -8 \\ \hline 40 \\ -40 \\ \hline 0 \end{array}$$

Topic 12-2 Area of Parallelograms and Rhombuses

★ Formula:



h = height

b = base

$$\text{Area} = \text{base} \times \text{height}, \quad b \times h, \quad \text{or} \quad b \cdot h$$

1.

A hand-drawn diagram of a parallelogram. A vertical dashed line from the top side to the bottom side is labeled '8 in' with a small square at the intersection point. A horizontal line segment along the bottom side is labeled '10 in' with a small square at the left end.

$$A = b \times h$$
$$A = 10 \times 8$$
$$A = 80 \text{ in}^2$$

2.

A hand-drawn diagram of a parallelogram. A vertical dashed line from the top side to the bottom side is labeled '21.5 in' with a small square at the intersection point. A horizontal line segment along the bottom side is labeled '20 in' with a small square at the left end.

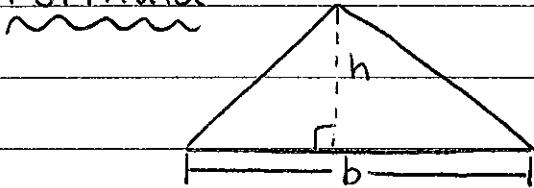
$$A = b \times h$$
$$A = 20 \times 21.5$$
$$A = 430 \text{ in}^2$$
$$\begin{array}{r} 21.5 \\ \times 20 \\ \hline 000 \\ +4300 \\ \hline 4300 \end{array}$$

3. Parallelogram: $b = 27 \text{ ft}$; $h = 32 \text{ ft}$ $A = ?$

$$A = b \times h$$
$$A = 27 \times 32$$
$$A = 864 \text{ ft}^2$$
$$\begin{array}{r} 27 \\ \times 32 \\ \hline 54 \\ +810 \\ \hline 864 \end{array}$$

Topic 12-3 Area of Triangles

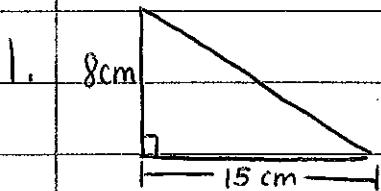
★ Formula:



h = height

b = base

$$\text{Area} = \frac{1}{2} \times \text{base} \times \text{height}, \frac{1}{2}b \times h, \text{ or } \frac{1}{2}bh$$



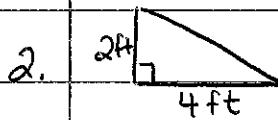
$$A = \frac{1}{2}bh$$

$$A = \frac{1}{2} \times 15 \times 8$$

$$A = \cancel{7.5} \times 8$$

$$A = 60 \text{ cm}^2$$

$$\begin{array}{r} 7.5 \\ \times 8 \\ \hline 60.0 \end{array}$$

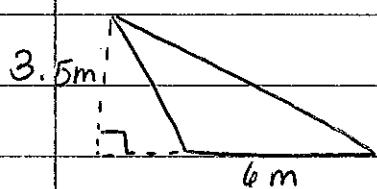


$$A = \frac{1}{2}bh$$

$$A = \frac{1}{2} \times 4 \times 2$$

$$A = \cancel{\frac{1}{2}} \times 2$$

$$A = 4 \text{ ft}^2$$



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

$$A = \frac{1}{2} \times 6 \times 3.5$$

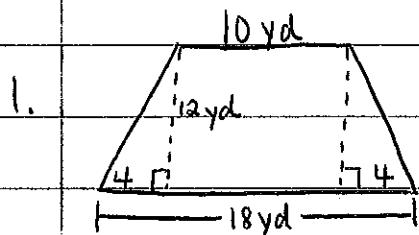
$$A = \cancel{3} \times 5$$

$$A = 15 \text{ m}^2$$

Topic 12-4 Area of Special Quadrilaterals

★ Trapezoid - a quadrilateral that has only one pair of opposite sides that are parallel

★ Kite - a quadrilateral with 2 pairs of adjacent sides that are equal in length.



★ Divide the trapezoid into 2 triangles + 1 rectangle

$$\text{Triangles: } A = \frac{1}{2}bh$$

Rectangle:

$$A = l \times w$$

$$A = 12 \times 10$$

$$A = 120$$

$$A = \frac{1}{2} \times 4 \times 12$$

$$A = 2 \times 12$$

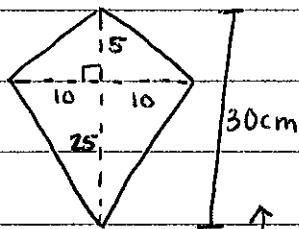
$$A = 24 + 24$$

There are 2 triangles

$$120 + 48$$

$$168 \text{ yd}^2$$

2.



★ Divide the kite into 2 triangles

$$\text{Triangles: } A = \frac{1}{2}bh$$

$$b = 25 + 5 = 30$$

$$h = 10$$

$$A = \frac{1}{2} \times 30 \times 10$$

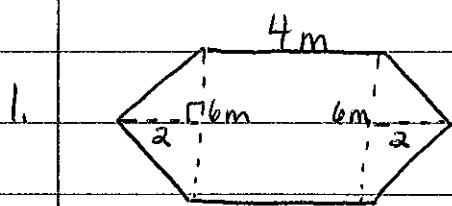
$$A = 15 \times 10$$

$$A = 150 \times 2$$

There are 2 triangles

$$A = 300 \text{ cm}^2$$

Topic 12-5 Finding Areas of Polygons



1.

Step 1: Divide the polygon into parts.

Step 2: Find the area of each part.

Step 3: Combine (Add) the areas together.

$$\text{Triangles: } A = \frac{1}{2}bh$$

$$A = \frac{1}{2} \times 6 \times 2$$

$$A = 3 \times 2$$

$$A = 6 \times 2 \quad \text{There are 2 triangles}$$

$$A = 12$$

$$\text{Rectangle: } A = l \times w$$

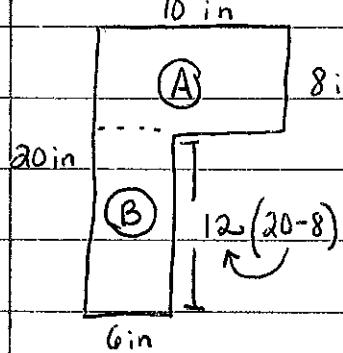
$$A = 6 \times 4$$

$$A = 24$$

$$\text{Combine: } 12 + 24$$

$$36 \text{ m}^2$$

2.



Rectangle

$$A = l \times w$$

$$A = 10 \times 8$$

$$A = 80$$

Rectangle B

$$A = l \times w$$

$$A = 6 \times 12$$

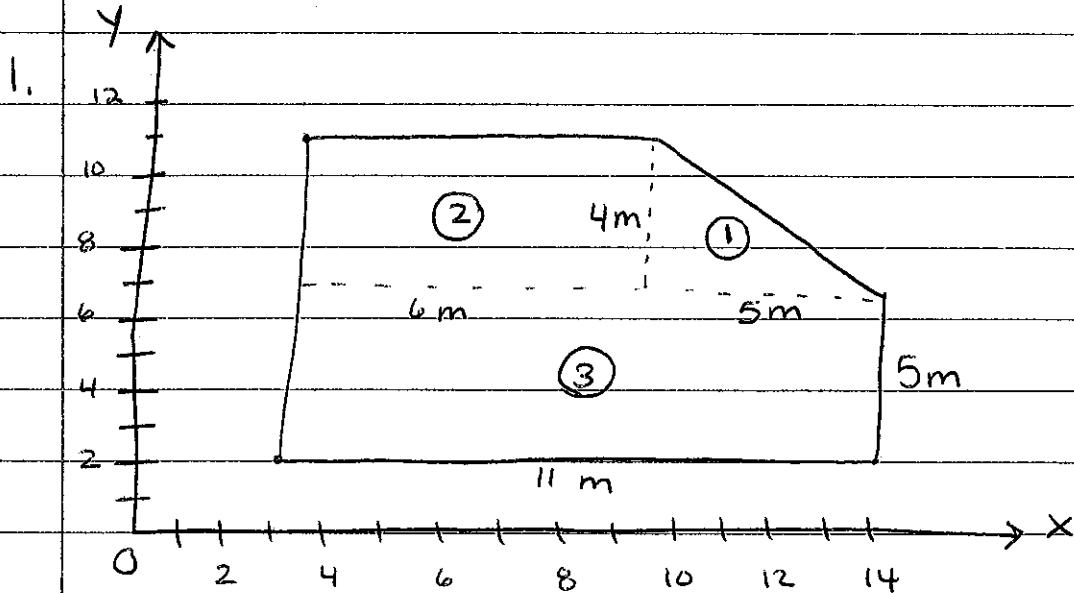
$$\text{Combine: } 80$$

$$\begin{array}{r} + 72 \\ \hline 152 \end{array}$$

$$A = 72$$

$$A = 152 \text{ in}^2$$

Topic 12-6 Areas of Polygons on the Coordinate Plane



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

$$\textcircled{1} \quad A = \frac{1}{2} \times 5 \times 4$$

$$A = 2.5 \times 4$$

$$A = \textcircled{10}$$

Combine:

Rectangle: $A = l \times w$

$$\textcircled{2} \quad A = 6 \times 4$$

$$A = \textcircled{24}$$

Rectangle $A = l \times w$

$$\textcircled{3} \quad A = 11 \times 5$$

$$A = \textcircled{55}$$

$$\begin{array}{r} 10 \\ + 24 \\ \hline + 55 \\ \hline 89 \end{array}$$

$$\boxed{A = 89 \text{ m}^2}$$

Topic 12-7 Problem Solving: Use Objects

- ★ A pentomino is an arrangement of (5) identical squares, each having a common side with at least one other square. There are (12) possible pentominoes.

