GEOMETRY UNIT 10

11-1: Area of Rectangles and Squares

WARM-UP

- Use the graph sheet and shapes to estimate the area of each shape. Count each square as one unit.

AREA OF RECTANGLES

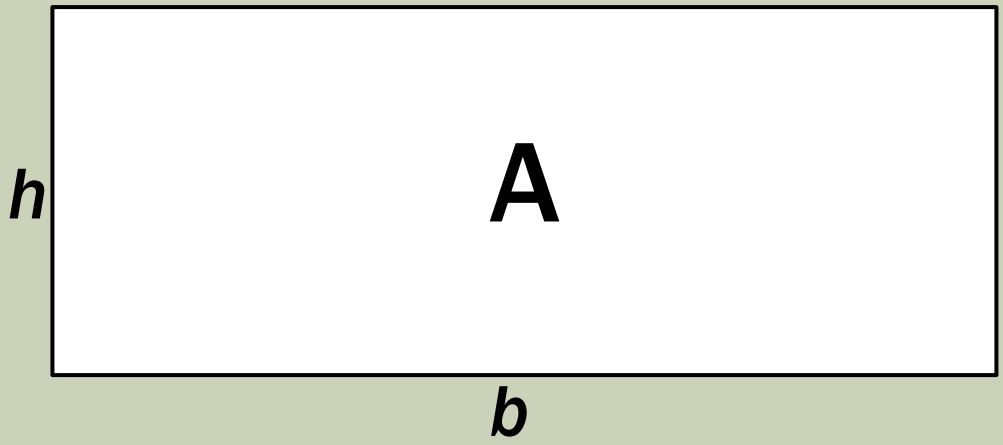
- **Content Objective**: Students will be able to use postulates and theorems to find the area of rectangles and squares.

- **Language Objective**: Students will be able to identify polygons and their appropriate area formulas.

AREA OF A RECTANGLE

- **Theorem 11-1**: The area of a rectangle equals the product of its base and height.

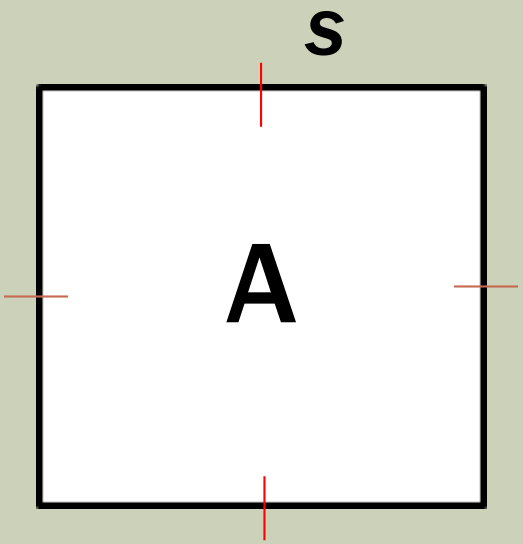
Equation: $A = bh$



POSTULATES

- **Postulate 17**: The area of a square is the square of the length of a side.

Equation: $A = s^2$



- **Postulate 18**: If two figures are congruent, then they have the same area.

POSTULATES

- **Postulate 19**: The area of a region is the sum of the areas of its non-overlapping parts.

Area of $ABCD = Area\ I + Area\ II + Area\ III$

PRACTICE

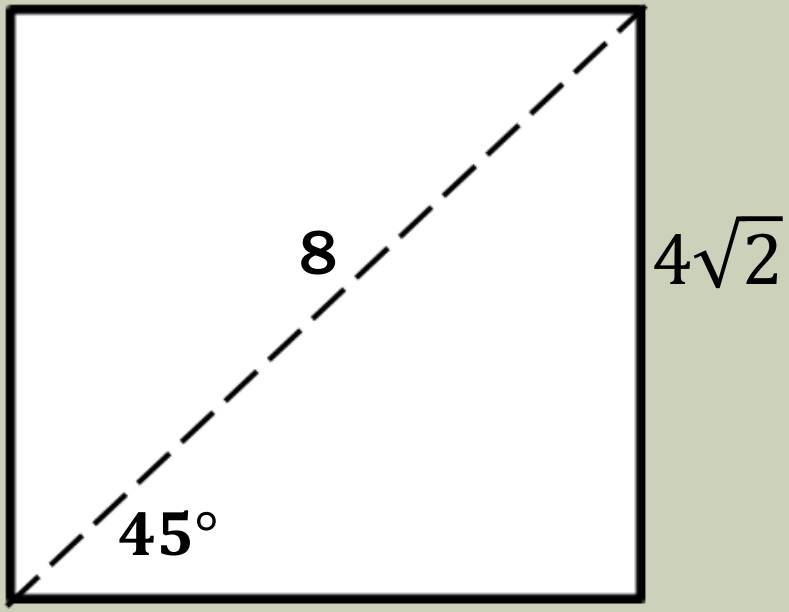
- Given that consecutive sides of the figures are perpendicular. Find the area of each figure.

Solution:

Area of a Square

$$A = (4\sqrt{2})^2$$

$$\boldsymbol{A = 16 \times 2 = 32}$$



PRACTICE

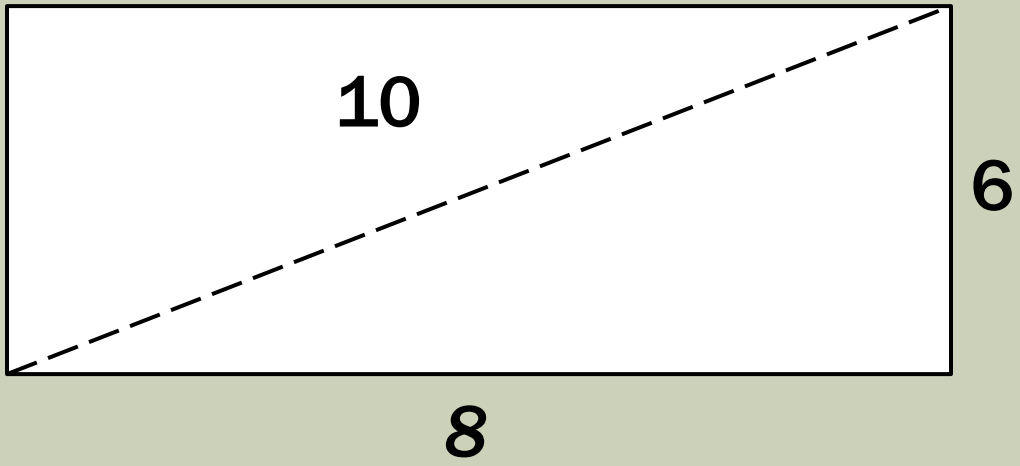
- Given that consecutive sides of the figures are perpendicular. Find the area of each figure.

Solution:

Area of a Rectangle

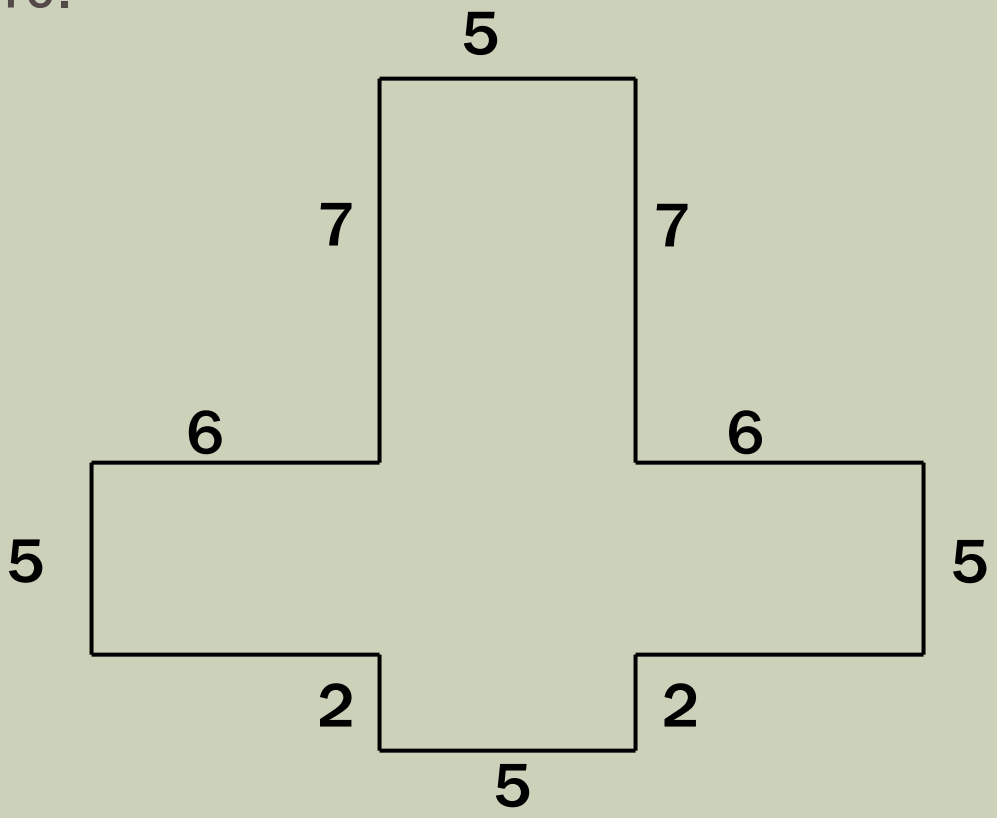
$$A = 6 \times 8$$

$$\boldsymbol{A = 48}$$



PRACTICE

- Given that consecutive sides of the figures are perpendicular. Find the area of each figure.



Solution:

Separate the Areas

$$A = 30 + 30 + 35 + 10 + 25$$

$$\boldsymbol{A = 130}$$

PRACTICE

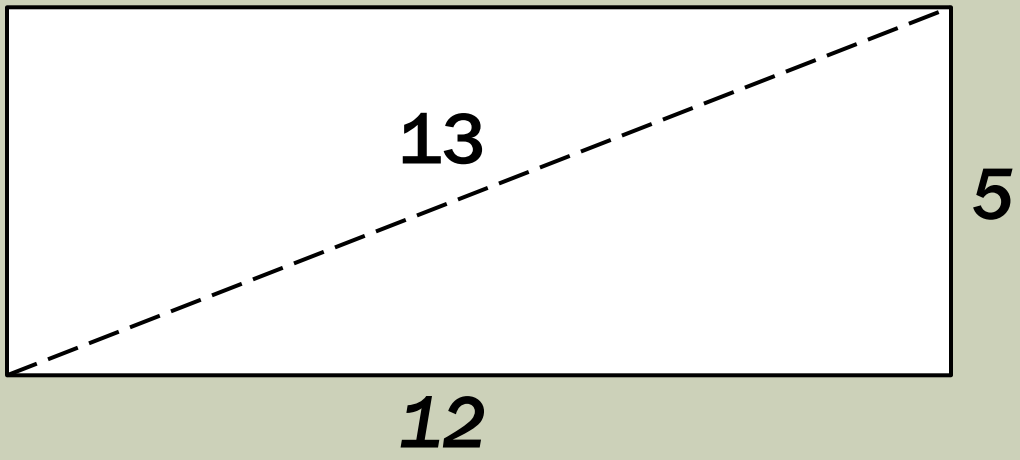
- The table below outlines the parts of a rectangle. Complete the Table.

b	8 cm	4 cm	12 m	**11**	$3\sqrt{2}$	$4\sqrt{2}$	$5\sqrt{3}$	$x+3$
h	3 cm	1.2 cm	**3**	5 cm	2	$\sqrt{2}$	$2\sqrt{3}$	x
A	**24**	**4.8**	$36\ m^2$	$55\ cm^2$	$6\sqrt{2}$	8	30	x^2+3x

GROUP PRACTICE

- Find the area for the following diagrams in your groups.

1.)



Solution:

Area of a Rectangle

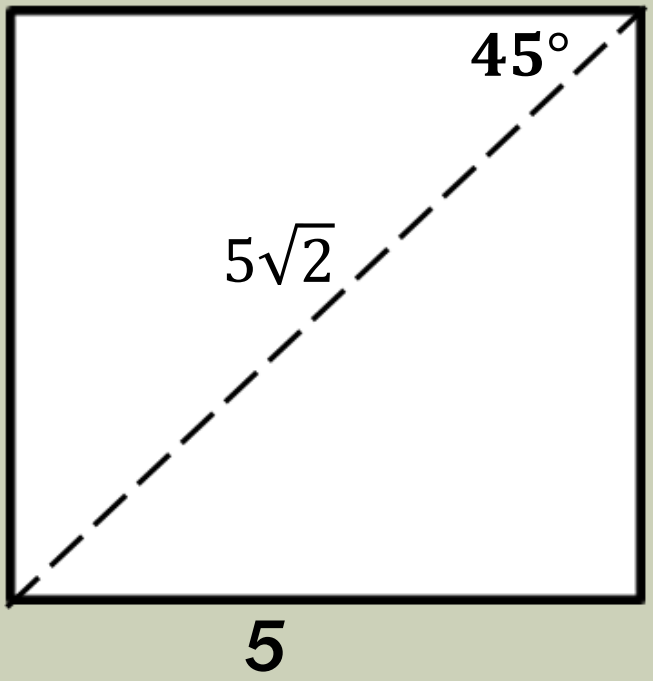
$$A = 5 \times 12$$

$$\boldsymbol{A = 60}$$

GROUP PRACTICE

- Find the area for the following diagrams in your groups.

2.)



Solution:

Area of a Square

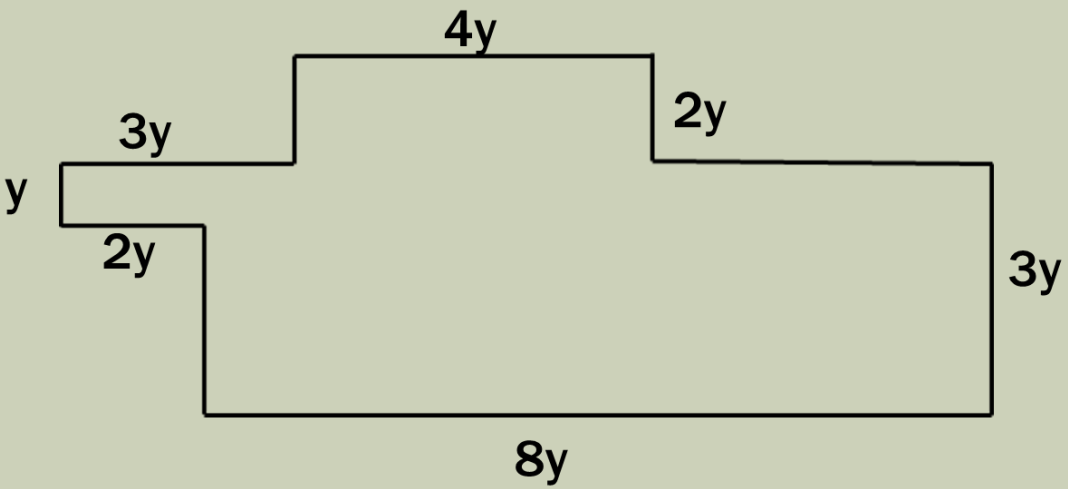
$$A = 5^2$$

$$\boldsymbol{A = 25}$$

GROUP PRACTICE

- Find the area for the following diagrams in your groups.

3.)



Solution:

Separate the Areas

$$A = 2y^2 + 24y^2 + 8y^2$$

$$\boldsymbol{A = 34y^2}$$

GROUP PRACTICE

- Find the area for the following diagrams in your groups.

4.)

$x - 5$

$x + 4$

Solution:

Area of a Rectangle

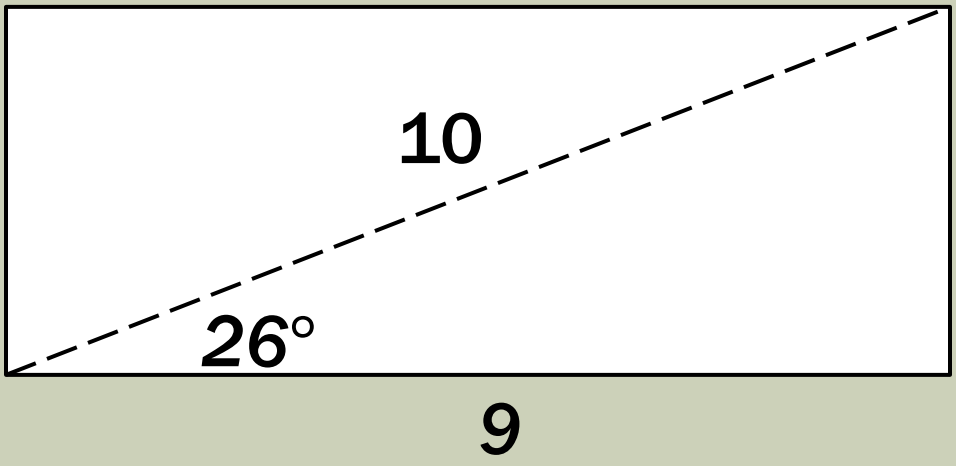
$$A = (x + 4)(x - 5)$$

$$\boldsymbol{A = x^2 - x + 20}$$

GROUP PRACTICE

- Find the area for the following diagrams in your groups.

5.)



Solution:

Area of a Rectangle

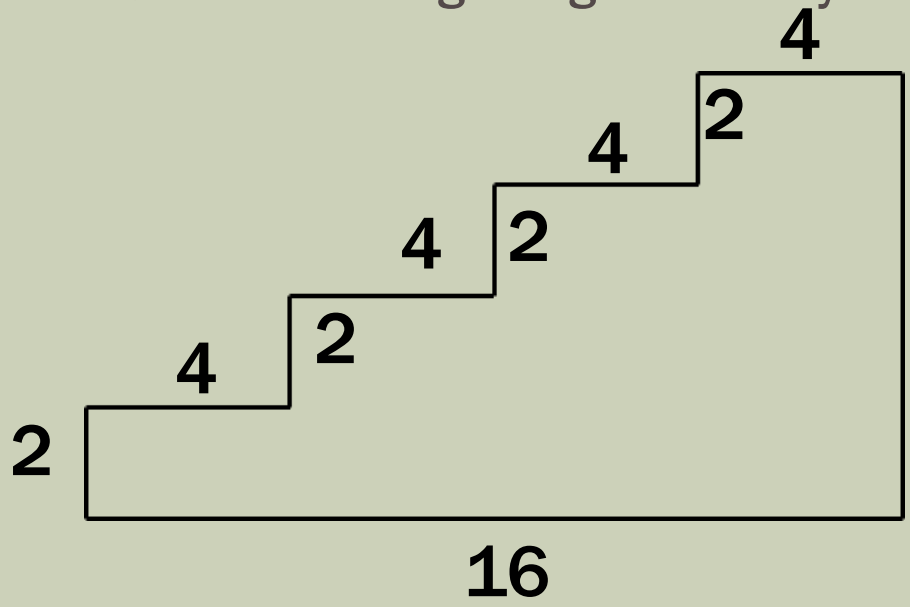
$$A = 9 \times 4.4$$

$$\boldsymbol{A = 39.6}$$

GROUP PRACTICE

- Find the area for the following diagrams in your groups.

6.)



Solution:

Separate the Areas

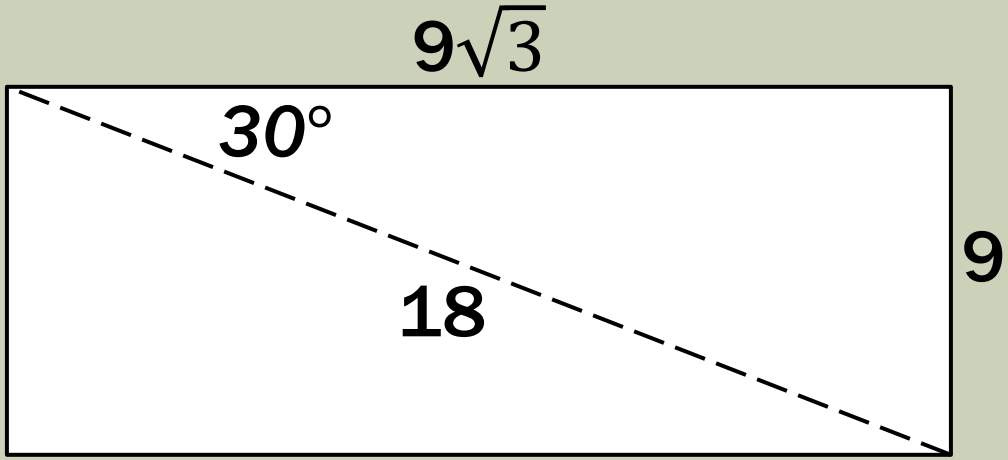
$$A = 32 + 24 + 16 + 8$$

$$\boldsymbol{A = 80}$$

GROUP PRACTICE

- Find the area for the following diagrams in your groups.

7.)



Solution:

Area of a Rectangle

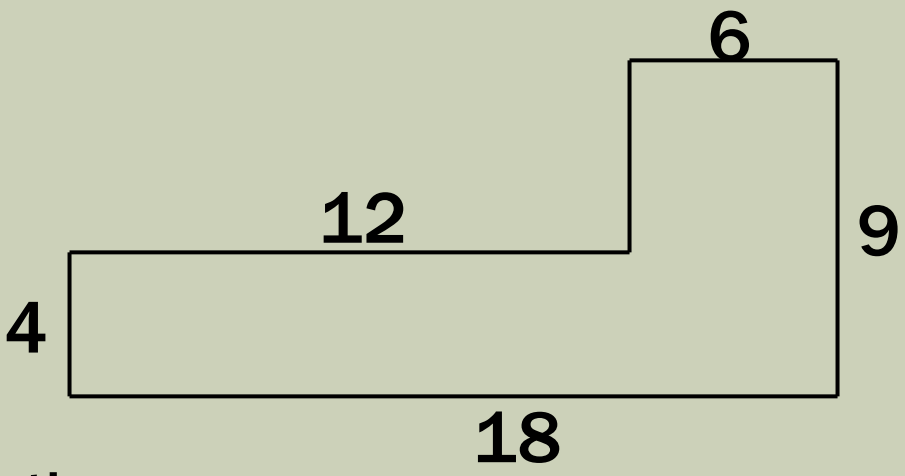
$$A = 9 \times 9\sqrt{3}$$

$$\boldsymbol{A = 81\sqrt{3}}$$

GROUP PRACTICE

- Find the area for the following diagrams in your groups.

8.)



Solution:

Separate the Areas

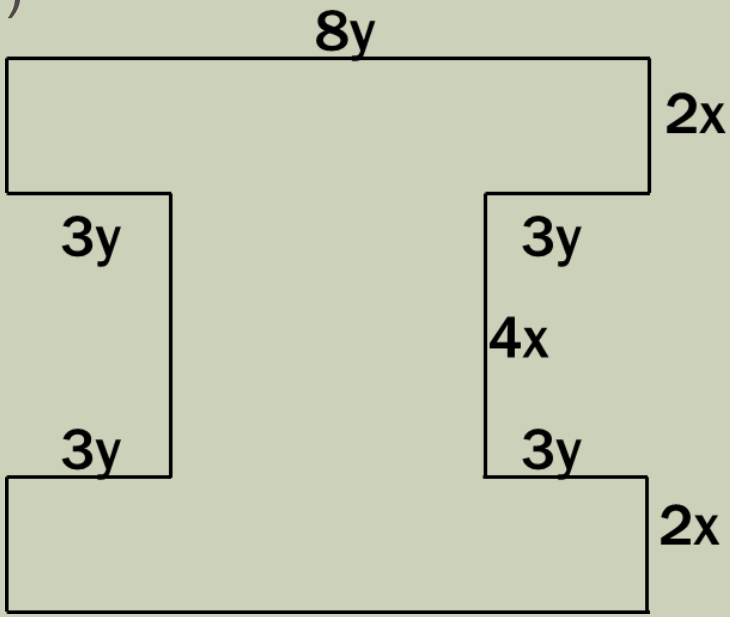
$$A = 48 + 54$$

$$\boldsymbol{A = 102}$$

GROUP PRACTICE

- Find the area for the following diagrams in your groups.

9.)



Solution:

Separate the Areas

$$A = 16xy + 16xy + 8xy$$

$$\boldsymbol{A = 40xy}$$

PRACTICE

- The table below outlines the parts of a rectangle. Complete the Table.

b	9 cm	40 cm	16 cm	$x+5$	$a+3$	$k+7$	x	y^2+7y
h	4 cm	10 cm	3	x	$a-3$	4	$x+3$	x
A	36	400	$48\ cm^2$	x^2+5x	a^2-9	$4k+28$	x^2+3x	xy^2+7xy