Math 6: Week of June 1st (Last Packet)

Unit: Geometry

Lesson 4: Area of Regular Polygons
   Target: Find the area of regular polygons using our knowledge about triangles.
Lesson 5: Area of Composite Figures
   Target: Find the area of composite figures using specific formulas from other shapes.

Directions:
- Go through the slides (notes) and work through the examples on a separate piece of paper. If you have your math notebook, use it!
- Complete the practice problems on a separate piece of paper. You can use a calculator but continue to show your work.
- Check your answers with the key given at the end of the lesson. If you got one wrong, double check your steps with your notes and recalculate it.
- Are you stuck?
    1. Use Google Classroom or Gmail to ask Mrs. Thomas a question.
    2. Live video helps sessions: Thursdays at 9:30am using Meet through Google Classroom
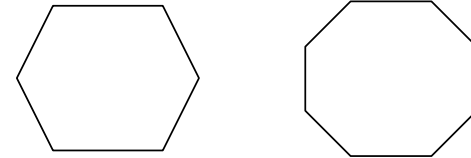

Area of Regular Polygons
Lesson 4

<u>Vocabulary-</u>

   Regular Polygon: a polygon in which all sides have the <u>same length</u> and all the <u>angles are congruent</u> (exactly the same).

Area of Regular Polygons
Lesson 4

<u>Regular Polygons</u> (Examples):

<u>Tria</u>ngle = 3 sides	<u>Hepta</u>gon = 7 sides
<u>Quad</u>rilateral = 4 sides	<u>Octa</u>gon = 8 sides
<u>Penta</u>gon = 5 sides	<u>Nona</u>gon = 9 sides
<u>Hexa</u>gon = 6 sides	<u>Deca</u>gon = 10 sides

Area of Regular Polygons
Lesson 4

1. Find the area of a regular polygon by <u>dividing the area into congruent triangles</u> and finding the area of <u>one triangle</u>.

2. Multiply the area by the number of total triangles, or sides, there are.

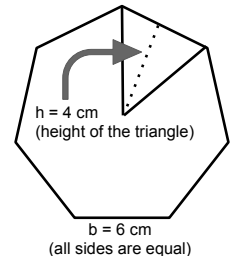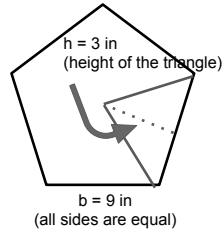**Find the area of the <u>heptagon</u>. (7 sides)**

Area of a triangle: $A = \frac{1}{2} bh$
$A = 0.5 \times 6 \times 4$
$A = 12$ cm^2

Area of one triangle x total number of triangles (or sides)
12 cm^2 x $7 = $ **84 cm^2**

h = 4 cm (height of the triangle)

b = 6 cm (all sides are equal)

Area of Regular Polygons

Lesson 4

1. Find the area of a regular polygon by <u>dividing the area into congruent triangles</u> and finding the area of <u>one triangle</u>.

2. Multiply the area by the number of total triangles, or sides, there are.

Find the area of the <u>pentagon</u>. (5 sides)

Area of a triangle: $A = \frac{1}{2} bh$

$A = 0.5 \times 9 \times 3$

$A = 13.5$ in²

Area of one triangle x total number of triangles (or sides)

13.5 in² $\times 5 =$ **67.5 in²**

h = 3 in
(height of the triangle)

b = 9 in
(all sides are equal)

Area of Regular Polygons

Lesson 4

1. Find the area of a regular polygon by <u>dividing the area into congruent triangles</u> and finding the area of <u>one triangle</u>.

2. Multiply the area by the number of total triangles, or sides, there are.

Find the area of the <u>octagon</u>. (8 sides)

Area of a triangle: $A = \frac{1}{2} bh$

$A = 0.5 \times 1.5 \times 2$

$A = 1.5$ ft²

Area of one triangle x total number of triangles (or sides)

1.5 ft² $\times 8 =$ **12 ft²**

h = 2 ft
(height of the triangle)
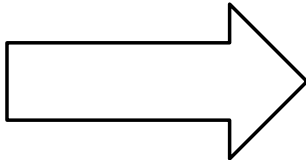
b = 1.5 ft
(all sides are equal)
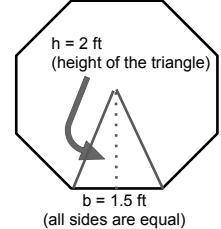
Area of Composite Figures

Lesson 5

<u>Vocabulary-</u>

Composite Figure: a shape made up of more simpler figures.
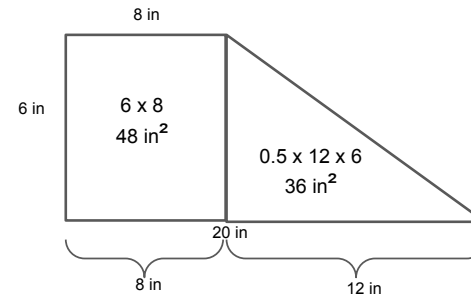
* This arrow can be divided into a rectangle and a triangle. We can then calculate the area of the entire figure.

Area of Composite Figures

Lesson 5

1. Find the area of each shape individually.
2. Combine each area together for the total composite figure.

8 in

6 in

6 x 8
48 in²

0.5 x 12 x 6
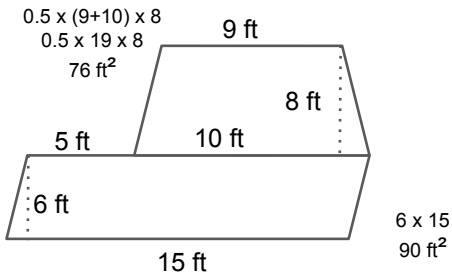36 in²

20 in

8 in   12 in

Rectangle: 48 in²

Triangle: 36 in²

Total Figure: 36 + 48

84 in²

Area of Composite Figures

1. Find the area of each shape individually.
2. Combine each area together for the total composite figure.

0.5 x (9+10) x 8
0.5 x 19 x 8
76 ft^2

9 ft

8 ft

5 ft   10 ft

6 ft

6 x 15
90 ft^2

15 ft

Trapezoid: 76 ft²

Parallelogram: 90 ft²

Total Figure: 76 + 90

166 ft²

Practice Problems: Worksheets

Lesson 4 ~ Area of Regular Polygons
Lesson 5 ~ Area of Composite Figures

Check your work!

Worksheet
Answers
Provided Here!

If you're stuck, ASK!
Live Meet help sessions
are provided every
Thursday at 9:30am.
Check Google Classroom
for more information.

L4~ Area of Regular Polygons

1. Done for you
2. 139.5 yd^2
3. 52.8 in^2
4. 117 ft^2
5. 162.4 cm^2
6. 130.5 in^2
Challenge
7. Area of each triangle: 16.1 in^2
   Height of each triangle: 7 in

L5~ Area of Composite Figures

1. Done for you
2. 180 ft^2
3. 128 yd^2
Challenge
4. 155 in^2
5. 204 yd^2

Name _____

Area of Regular Polygons

Find the area of the regular polygon.

1.
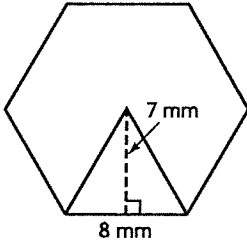
number of congruent triangles inside the figure: _____6_____

area of each triangle: $\frac{1}{2} \times$ ___8___ $\times$ ___7___ = ___28___ mm²

7 mm

8 mm

area of hexagon: ___168 mm²___

2.

6.2 yd

9 yd

_____

3.
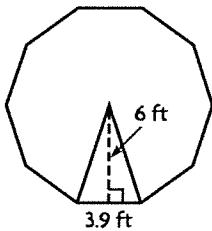
4 in.
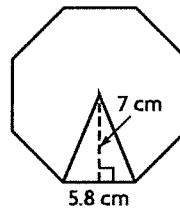
3.3 in.

_____

4.

6 ft

3.9 ft

_____

5.

7 cm

5.8 cm

_____

Problem Solving

6. Stu is making a stained glass window in the shape of a regular pentagon. The pentagon can be divided into congruent triangles, each with a base of 8.7 inches and a height of 6 inches. What is the area of the window?

_____

7. A dinner platter is in the shape of a regular decagon. The platter has an area of 161 square inches and a side length of 4.6 inches. What is the area of each triangle? What is the height of each triangle?

_____

Composite Figures
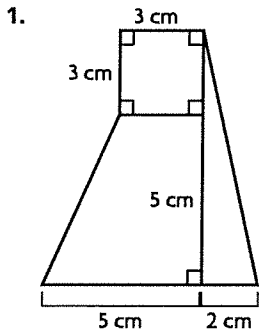
Find the area of the figure.

1.

3 cm
3 cm
5 cm
5 cm   2 cm

area of square $A = s \times s$

$= \underline{3} \times \underline{3} = \underline{9}$ cm^2

area of triangle $A = \frac{1}{2}bh$

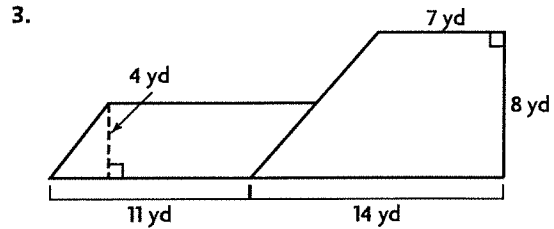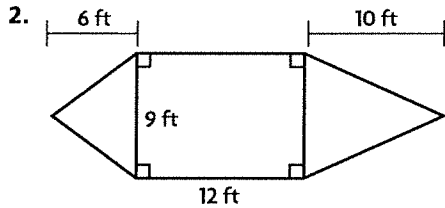$= \frac{1}{2} \times \underline{2} \times \underline{8} = \underline{8}$ cm^2

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

$= \frac{1}{2} \times (\underline{5} + \underline{3}) \times \underline{5} = \underline{20}$ cm^2

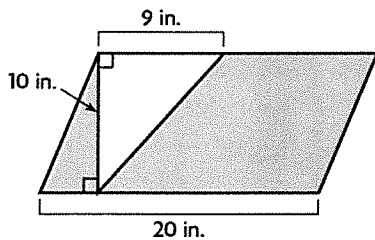area of composite figure $A = \underline{9}$ cm$^2 + \underline{8}$ cm$^2 + \underline{20}$ cm^2

$= \underline{37}$ cm^2

2.

6 ft   10 ft
9 ft
12 ft

_____

3.

7 yd
4 yd
8 yd
11 yd   14 yd

_____

Problem Solving REAL WORLD

4. Janelle is making a poster. She cuts a triangle out of poster board. What is the area of the poster board that she has left?

9 in.
10 in.
20 in.

_____

5. Michael wants to place grass on the sides of his lap pool. Find the area of the shaded regions that he wants to cover with grass.

25 yd
12 yd
3 yd   12 yd

_____