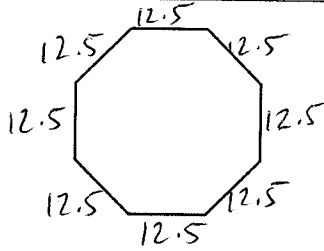


Name: Key Period: 1-5

### FINDING AREA of REGULAR POLYGONS—Let's get it on!

The UFC's cage is the shape of a **regular Octagon**. This is a figure with 8 sides; all sides & angles congruent.

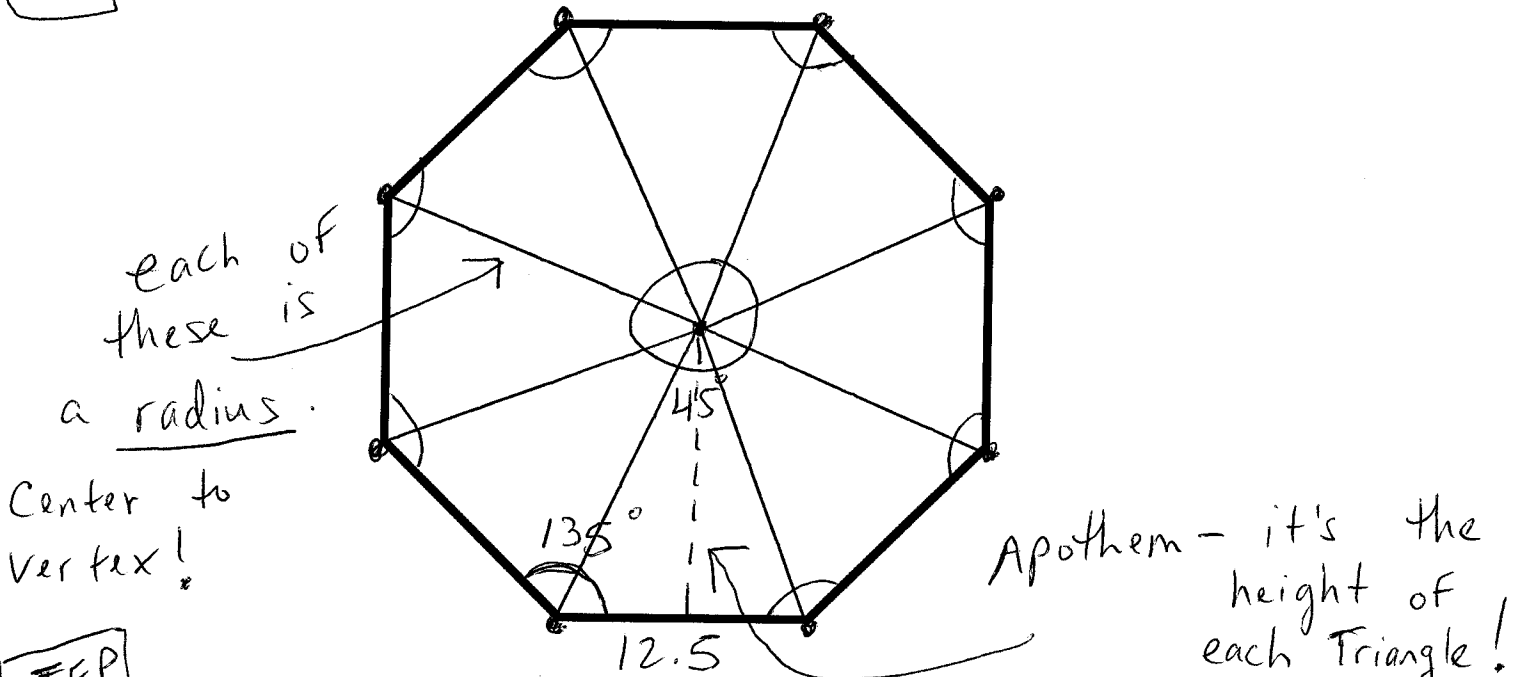


Each side of the cage is made up of a steel fence that is 12.5' wide. Let's sketch this in.

The **Perimeter** of this Octagon would therefore be 100 Feet.  
 $12.5 * 8$

The UFC needs to order a new canvas (mat) for their Octagonal Cage! We need to know what the **AREA** is—in square feet—of this Octagon!

**STEP 1** So, let's break this octagon into **triangles**, since we know how to deal with them already!



**STEP 2** We need to know the **Angles** of the triangle to do our job. We can find these two ways:

#### Central Angle 360° Method

$$360^\circ \text{ about center} \\ \div 8 \text{ angles} = 45^\circ \text{ each}$$

#### Interior Angle Theorem Method

$$(n-2) * 180 \\ (8-2) * 180 = 1080 \div 8 \\ = 135^\circ \text{ each}$$

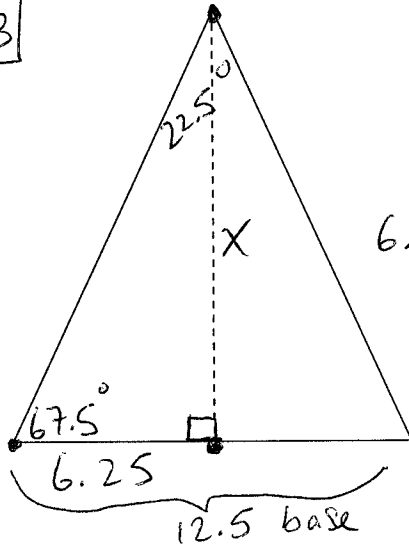


Name: \_\_\_\_\_ Period: \_\_\_\_\_

### FINDING AREA of REGULAR POLYGONS—Let's get it on!

Now, let's find the Area of the Triangle. We got good at this last week ☺

**STEP 3**



\* We need apothem, the height! Use Tangent ☺

$$6.25 * \tan 67.5 = \frac{X}{6.25} * 6.25$$

$$15 = X$$

**STEP 4**

$$\text{AREA} = \frac{1}{2} * \frac{12.5}{\text{Base}} * \frac{15}{\text{Height}} = \underline{93.75 \text{ Ft}^2}$$

**STEP 5**

Lastly, Remember that this area of 93.75 is for just one Triangle.

However, the OCTAGON is made up of 8 of these triangles, so we have to multiply by 8 to get the FINAL ANSWER of 750 Ft<sup>2</sup>.

Now, IT'S TIME for your assignment! Let's get it on!

↑  
This is true, btw.