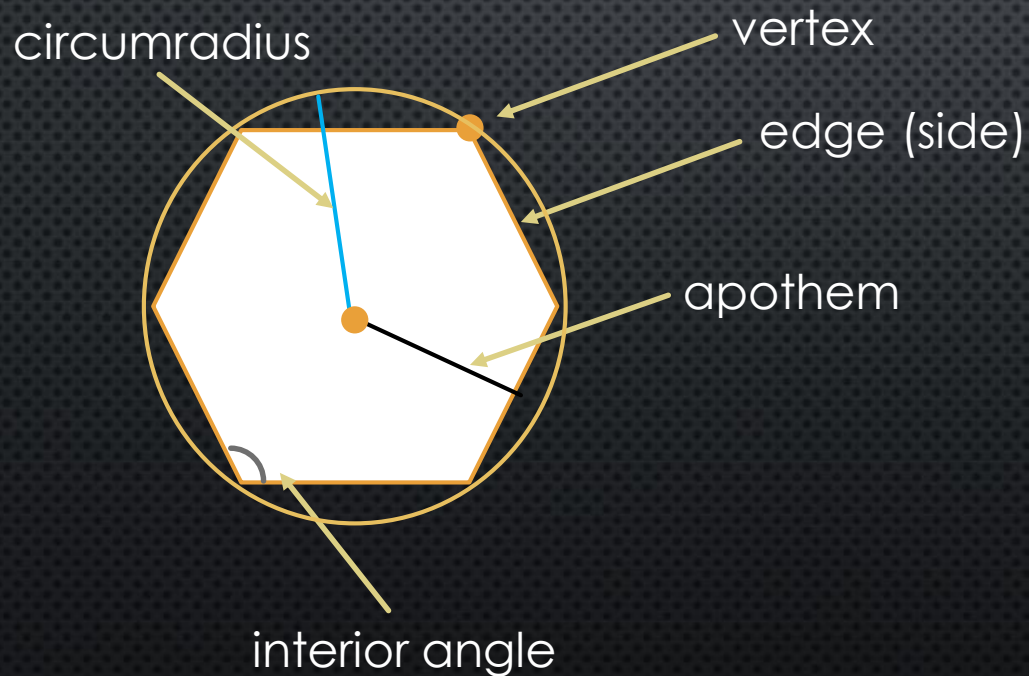


PROJECT

## Background Information

A regular strictly convex polygon is a polygon that has the following characteristics:

- all interior angles are less than  $180^\circ$
- all sides have equal length





## Background Information

For a regular strictly convex polygon with

- $n$  edges ( =  $n$  vertices)
- $R$  circumradius

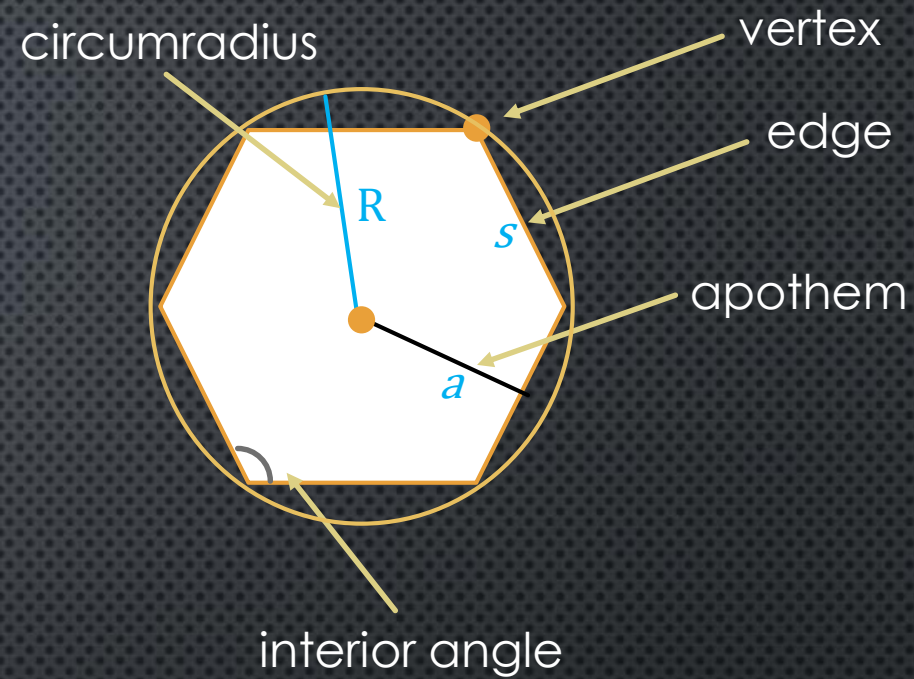
$$\text{interior angle} = (n - 2) \times \frac{180}{n}$$

$$\text{edge length } s = 2 R \sin\left(\frac{\pi}{n}\right)$$

$$\text{apothem } a = R \cos\left(\frac{\pi}{n}\right)$$

$$\text{area} = \frac{1}{2} n s a$$

$$\text{perimeter} = n s$$



## Goal 1

Create a `Polygon` class:

### Initializer

- number of edges/vertices
- circumradius

### Properties

- # edges
- # vertices
- interior angle
- edge length
- apothem
- area
- perimeter

### Functionality

- a proper representation (`__repr__`)
- implements equality (`==`) based on # vertices and circumradius (`__eq__`)
- implements `>` based on number of vertices only (`__gt__`)



## Goal 2

Implement a `Polygons` sequence type:

### Initializer

- number of vertices for largest polygon in the sequence
- common circumradius for all polygons

### Properties

- max efficiency polygon: returns the Polygon with the highest `area : perimeter` ratio

### Functionality

- functions as a sequence type (`__getitem__`)
- supports the `len()` function (`__len__`)
- has a proper representation (`__repr__`)