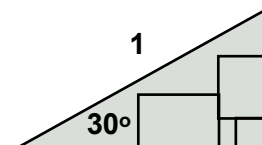
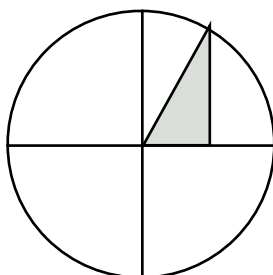
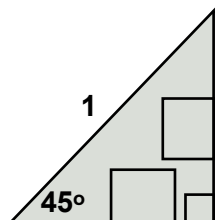


The unit circle will be extremely important in Calculus. It helps us to quickly recall the values of trig functions. So it is very important that you understand how the unit circle is built. When building the unit circle it will help to think about the unit circle as three different circles. One that was cut into 4 equal sections, one cut into 8 equal sections, and one that was cut into 12 equal sections.

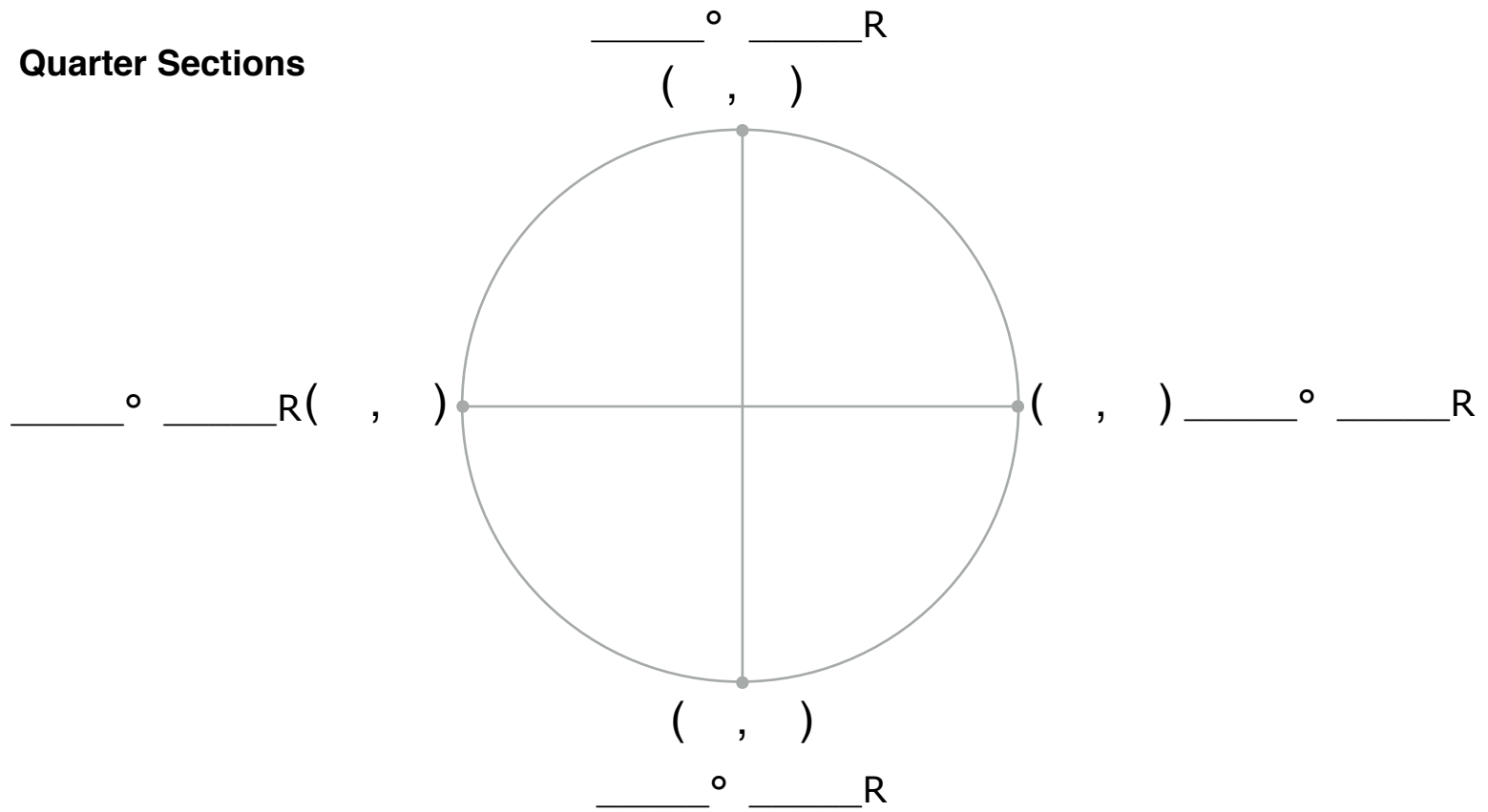
Remember that angle rotations start at the positive x-axis and rotate counter-clockwise.

1. How many degrees are in a full rotation?
2. How many degrees are in a half rotation?. Label the angle measures in the quartered circle.
3. How many degrees are in a quarter rotation? Label the angle measures of the quarter sections
4. Next, divide your circle into 8 equal sections (next page). How many degrees are in an eighth of a rotation?
5. Using the information above fill in the angle measurements for these 8 points along your unit circle template. Remember you should be labeling from  $0^\circ$  to  $360^\circ$ .
6. Now, think about dividing your circle into 12 equal sections. How many degrees are in a twelfth of a rotation?
7. Use this information to fill in the remaining angle measurements at the 12 points.
8. Using all the values, complete the degree angle measurements from  $0^\circ$  to  $360^\circ$  on the complete version of the unit circle.
9. Now, we need to fill in the radian degree measurements. How many radians are in a full rotation?
10. How many radians are in a half rotation? What about half of that, or a quarter of a rotation?
11. What are the radian measures that correspond to the following degree measures?
  - a.  $30^\circ$
  - b.  $45^\circ$
  - c.  $60^\circ$
12. Label all the angle measures on your circles in radians.
13. Complete the **exact** lengths of the sides of the special right triangles below (no decimals). Note that the hypotenuse has length 1. You should be familiar with the lengths of the sides.
14. Now we cut out our special right triangles below.
15. Using the triangles manipulate them to fit in your unit circle with one vertex on the center and one vertex on the appropriate point. An example is shown below. Label of the points (coordinates) of the quartered circle, eighth circle, 12th circle. then fill on the coordinates of the points on the completed unit circle.

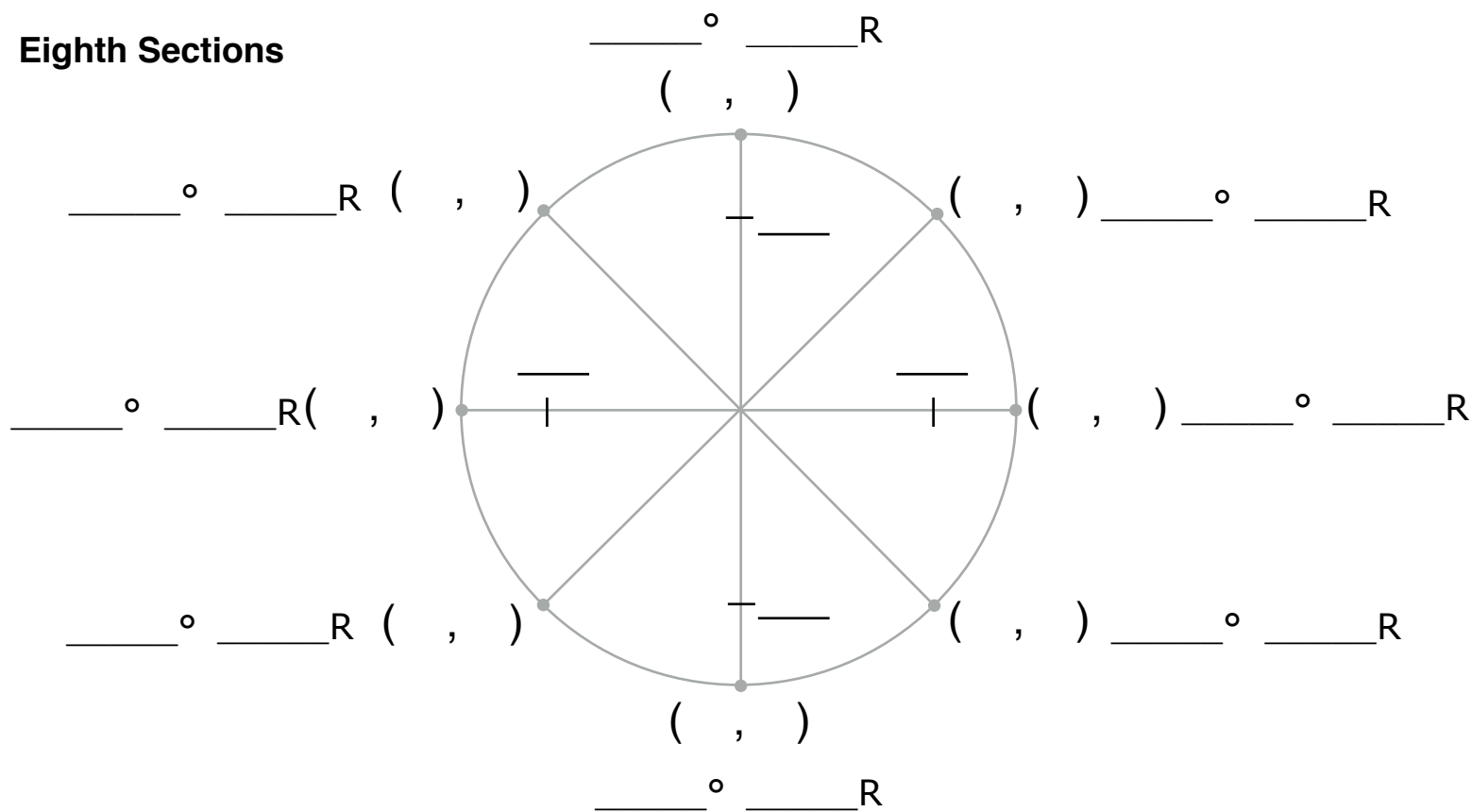


Complete the coordinates, angles in degrees, and angles in radians for each of the following unit circles.

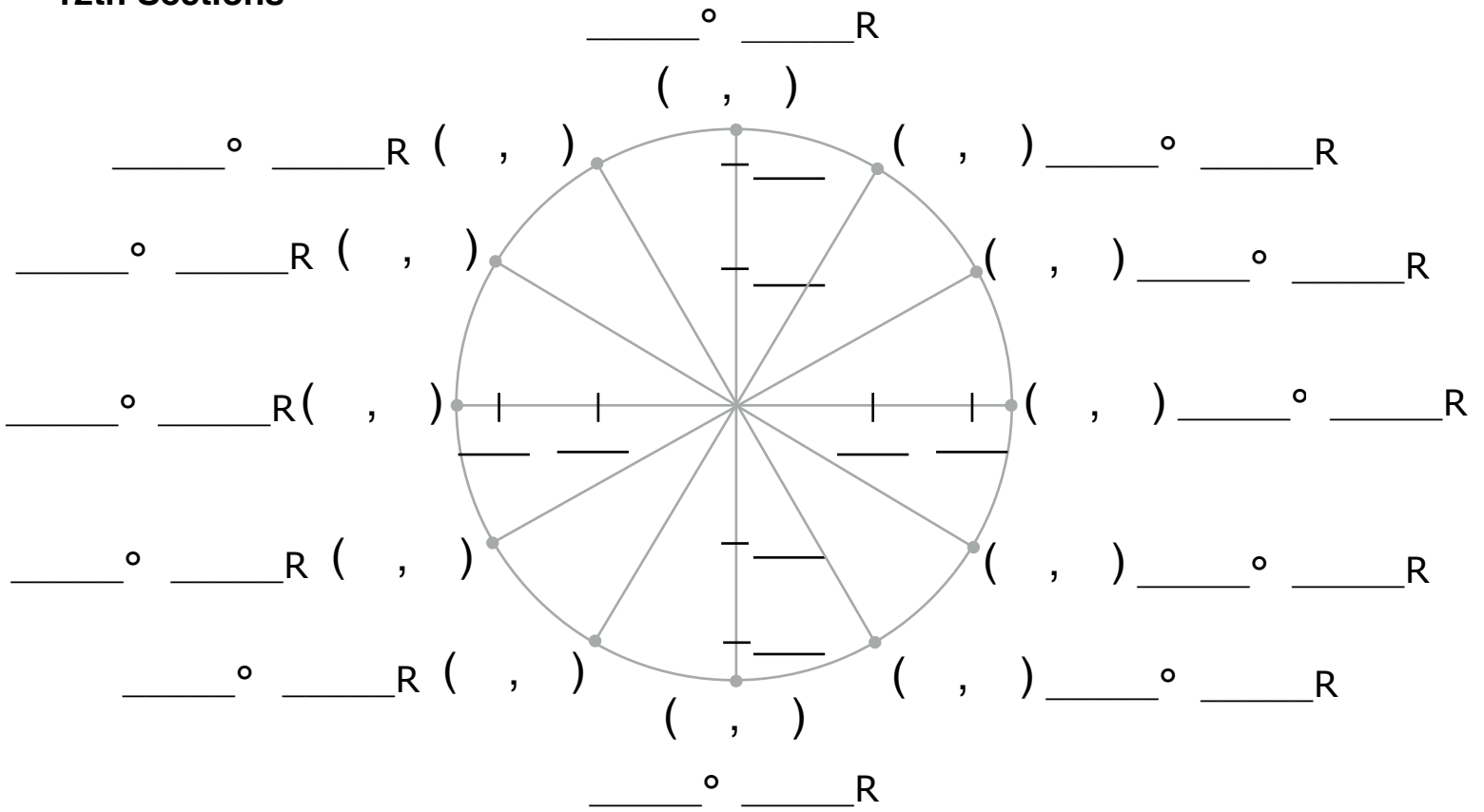
## Quarter Sections



## Eighth Sections



## 12th Sections



Now fill in the complete unit circle.

# COMPLETE

