

**CALCULUS JOURNAL**  
**AREA & VOLUME**

1. When finding the area between a single curve and the  $x$ -axis, regions located \_\_\_\_\_ must be subtracted.
2. Function  $k$  is above the  $x$ -axis and function  $m$  is below the  $x$ -axis, the area between the functions would be calculated by \_\_\_\_\_.
3. Functions  $p$  and  $q$  are both located below the  $x$ -axis with  $q$  higher than  $p$ . The area between the two curves would be calculated by \_\_\_\_\_.
4. When the orientation of the rectangle is vertical, the functions will be subtracted in the order \_\_\_\_\_, but when the orientation of the rectangle is horizontal, the functions will be subtracted in the order \_\_\_\_\_.
5. When the orientation of the rectangle is horizontal, the problem will be expressed as \_\_\_\_\_ = \_\_\_\_\_, while the problem will be expressed as \_\_\_\_\_ = \_\_\_\_\_ when the orientation of the rectangle is vertical.
6. (a) When using the disk method to calculate the volume of an area revolved around a vertical line other than the  $y$ -axis, you can determine whether to subtract the curve minus the line or the line minus the curve using \_\_\_\_\_.
- (b) If the region is revolved around a horizontal line other than the  $x$ -axis, the equations should be subtracted in the order \_\_\_\_\_.
7. The shell method is to be used to calculate the volume of an area revolved around a line other than the  $x$ - or  $y$ -axis. If the rectangle has vertical orientation, the height of the cylindrical shell will be calculated by subtracting \_\_\_\_\_ while the radius will be calculated by subtracting \_\_\_\_\_.
8. (a) When calculating volume by slicing, the region enclosed by the given equations forms the \_\_\_\_\_ of the solid and the slices are positioned \_\_\_\_\_.
- (b) The theory of calculating volume by slicing works by calculating the volume of \_\_\_\_\_ and \_\_\_\_\_ the volume of all of the slices using \_\_\_\_\_.
9. Describe a real world situation where someone might need to know each of the following:  
 Area of a curved region \_\_\_\_\_  
 Volume of a solid of revolution \_\_\_\_\_  
 Surface area of a solid of revolution \_\_\_\_\_
10. List the following rules, facts, or formulas.
  - a) Formula for the disk method, orientation of the rectangle

b) Formula for the shell method, orientation of the rectangle

c) Formula for finding volume of a solid by slicing

d) Area formulas for finding volume by slicing with the given cross section:

Square \_\_\_\_\_

Right triangle \_\_\_\_\_

Equilateral triangle \_\_\_\_\_

Semicircle \_\_\_\_\_

e) Formula for calculating length of a curve

f) Formula for calculating surface area of a solid of revolution