Washer Method: Top 5 Student Mistakes

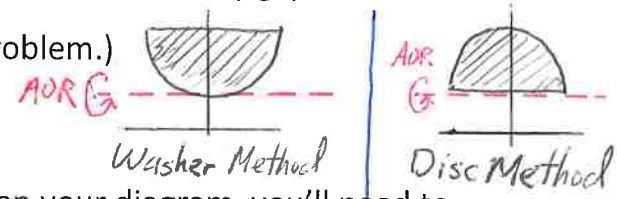
1) When drawing your radius, **Always include and connect to the Axis of Revolution (AOR, your dotted line)**. Don't connect between the 2 curves. That will not represent the radius. Remember, the AOR is the Center of the rotated object, so the radius needs to connect to the center.

2) Use appropriate Washer Method Formula. Remember to square each of the radius separately.

Correct:	**Incorrect:**
$V = \pi \int_{x_1}^{x_2} [R(x)]^2 - [r(x)]^2 dx$	$V = \pi \int_{x_1}^{x_2} [R(x) - r(x)]^2 dx$

3) The Axis of Revolution has NO impact on the bounds of integration. Your bounds purely depends on the boundaries of your shaded region.

4) Just because the Axis of Revolution is touching the shaded region does not automatically mean this is a Disc Method problem. **Disc Method** is only when the Axis of Revolution is up against **a flat surface** of the shaded region. An Axis up against a **curved surface** means this is **a Washer Method** problem. (As long as there is any gap between AOR and shaded region, this will be a washer method problem.)



5) Remember when you have Horizontal Radius drawn on your diagram, you'll need to adjust your equations so that they start with "x = ___" in order to use them for your radius expressions. The original equations in the form of "y = ____" are suitable for Top-Bottom (Vertical Radius) but not for Right-Left (Horizontal Radius).

6) Remember to distribute the negative through when creating the Radius expressions: Use parentheses to help. Top - (Bottom) or Right - (Left)