Recitation # 4: Volume by Shells

Warm up:

Problem 1 *Determine whether you should integrate in terms of x or y in the given scenarios:*

(a) *You are revolving around the y-axis and using shells.*

(b) *You are revolving around $y = 2$ and using washers.*

Problem 2 *Determine whether you should use washers or shells:*

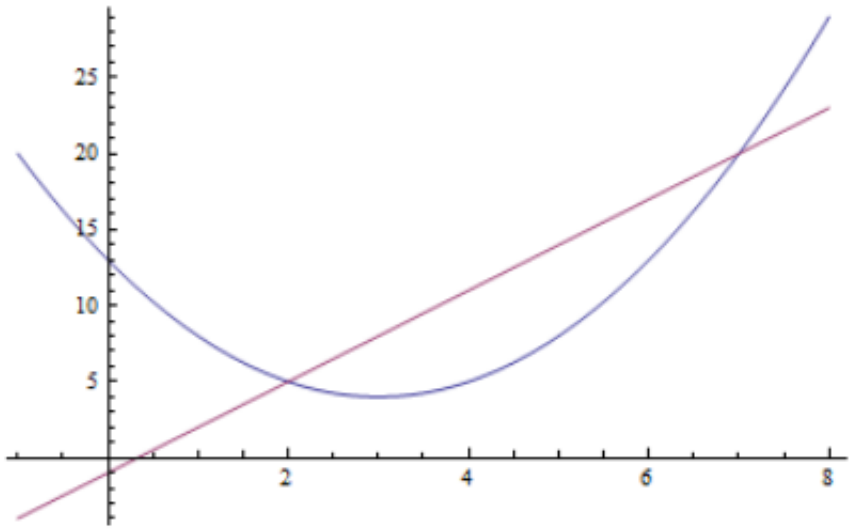
(a) *You are revolving around $x = 3$ and want to integrate in terms of y.*

(b) *You are revolving around the x-axis and want to integrate in terms of y.*

Group work:

Problem 3 *Consider the region bounded by $y = 2 - 2x$, $y = 2$, and $x = 1$. Use both the washer and shell method to find the volume of the solid formed by revolving this region around $y = -1$. Do your answers match?*

Problem 4 *Set up an integral that will compute the volume of the solid generated by revolving the region bounded by the curves $y = x^2 - 6x + 13$ (i.e. $x = 3 \pm \sqrt{y-4}$) and $y = 3x - 1$ about the given axes. Use the best/easiest method for each problem.*



(a) *the x-axis*

(b) $y = -4$

(c) $y = 22$

(d) *the y-axis*

(e) $x = -3$

(f) $x = 9$