Week 2 Recitation Problems
## MATH:114, Recitations 309 and 310

1. Suppose $f(x) = (x-1)^2$ and $g(x) = 2(x-1) + 3$. Plot these functions, and shade the region enclosed by them. Where do the curves intersect? What is the area of the enclosed region?

2. Take the region you drew and spin it all the way around the x-axis. This is called a *solid of revolution*, and it lives in ___-dimensional space. Now, draw cross-sections of the solid along the

  (a) xy plane that intersects the z-axis at the origin.

  (b) yz plane that intersects the x-axis at $x = 3$

  (c) xz plane that intersects the y-axis at $y = 1$.
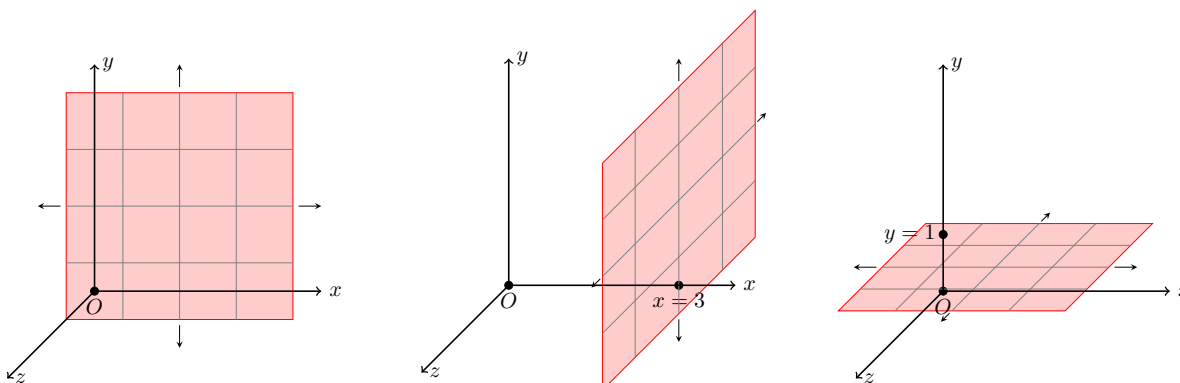
3. Write a formula for the area of each cross-section (hint: one is too hard, and two are familiar geometric ones). If we "shift" our intersection plane along the length of the solid, finding the area of each cross-section, what is the *sum* of these areas?

4. Choose an intersection plane. Write an integral that represents the sum of all the cross-sectional areas we get by shifting the plane along the solid.