Math 252: Quiz 2 **8 September, 2022**

Name: _____ / **25**

30 minutes maximum. No aids (book, calculator, etc.) are permitted. Show all work and use proper notation for full credit. Answers should be in reasonably-simplified form. 25 points possible.

1. **[7 points]** Find the area of the region in the first quadrant enclosed by $y = 2 - 2x$, $y = 2 - x^2$, and the x-axis. (*Hint: Careful sketch first. Integrating with respect to either x or y will work.*)

2. [13 points]

a. Sketch the region bounded by $y = x^2$, $y = 0$, and $x = 1$.

b. Find the volume of the solid formed by revolving the region in part **a.** around the x-axis. (*Hint: Use discs or washers.*)

c. Find the volume of the solid formed by revolving the region in part **a.** around the y-axis. (*Hint: Use discs or washers.*)

3. [5 points] A solid has a base which is the unit circle in the x, y plane, and each cross-section parallel to the x-axis is a square. Find the volume.

EC. [1 points] (**Extra Credit**) Rotating the line $y = x$, on the interval $0 \leq x \leq 1$, around the x-axis generates a cone. Find the area of this cone; do not include the area of the "base" of the cone at $x = 1$. (*Hint: No need to integrate! Unroll and do geometry!*)

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