Take-home Quiz 1   **Calc 2**   **Due 1/27/22**

Each question is worth 5 points. Show good justification for full credit. Open book, open notes, collaborate with anyone, but make sure you understand what you turn in well.

1. Derive Line 77 from the table of Integrals in Stewart:

$$\int \sec^n u \, du = \frac{1}{n-1} \tan u \sec^{n-2} u + \frac{n-2}{n-1} \int \sec^{n-2} u \, du$$

2. Show why the area inside the ellipse with equation $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ is πab.

3. Derive Line 43 from the Table of Integrals in Stewart:

$$\int \frac{du}{\sqrt{u^2 - a^2}} = \ln \left| u + \sqrt{u^2 - a^2} \right| + C$$