1. Compute $\int_2^4 t^3 \, dt$.

2. Compute $\int_2^4 e^{-t} \, dt$.

3. Compute $\int_0^1 \frac{1}{1+s^2} \, ds$

4. Compute $\int_{-1}^1 \sin(x) \, dx$. Then give a geometric answer to justify your result.

5. Compute $\int_0^{\frac{\pi}{2}} \cos(5x)\ dx$. You'll need to play around to find an antiderivative.

6. Compute $\int_1^2 \frac{t^3 - 3t^2}{t^4}\ dt$

7. Can the Fundamental Theorem of Calculus help you compute $\int_0^{\pi} \tan(x)\ dx$?

8. Can the Fundamental Theorem of Calculus help you compute $\int_0^{\pi} \tan(x)\ dx$?

9. Compute

$$\frac{d}{dx}\int_5^x \tan(\sqrt{s})\ ds$$

10. Compute

$$\frac{d}{dx}\int_5^{x^3} \tan(\sqrt{s})\ ds.$$

Hint: Let $H(x) = \int_5^x \tan(\sqrt{s})\ ds$. You're interested in $H(x^3)$. Apply the Chain Rule!

11. Challenge! Compute

$$\frac{d}{dx}\int_x^{x+1} \sqrt{s^2+1}\ ds.$$