

Please show **all** your work! Answers without supporting work will not be given credit.

Name: _____

1. **Logistics**

- Office Hours: MS 3957, Tuesday at 10a and Thursdays at 11a
- SMC: MS 3974 Monday-Thursday 9a-3p (I'll be there Thursdays at 10a)

2. **Definite Integrals as Sums**

Express the following as limits of Riemann Sums:

(a) $\int_{-1}^1 (x^2 - x) dx$

(b) $\int_{-1}^1 |x| dx$

(c) $\int_{-1}^1 |\cos(x)| dx$

3. **What did the acorn say when he grew up?**

Use geometry to evaluate the following definite integrals (remember that the area is signed, i.e. area below the x-axis is negative):

(a) $\int_{-1}^1 |x| dx$

(b) $\int_0^{10} \sqrt{25 - (x - 5)^2} + 5 dx$

(c) $\int_{-1}^4 x dx$

4. Just one more episode...

Assume that over an 11 week period, the rate at which you binge watch Netflix is given by

$$f(x) = \begin{cases} 28 & 0 \leq x \leq 3 \\ 31 - x & 3 < x \leq 9 \\ 40 & 9 < x \leq 10 \\ 10x - 100 & 10 < x \leq 11 \end{cases}$$

where x is weeks and $f(x)$ is hours watched per week. How many hours have you watched after the 11 weeks?

5. The Fun(damental) Theorem of Calculus

Evaluate the following definite integrals:

(a) $\int_{-1}^1 e^x dx$

(b) $\int_0^1 x^{2017} dx$

(c) $\int_0^{\pi/2} \cos(x) dx$