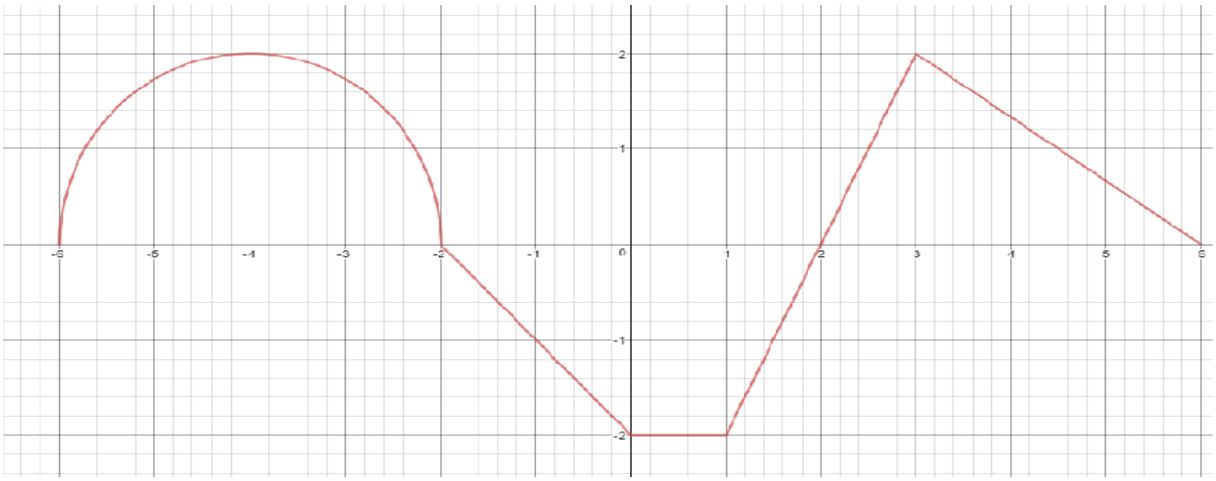
MATH 220 Exam 4 Review Exercises Part II

1. The graph of a function $f(x)$ is shown.



(a) Evaluate the following integrals.

$$\int_{-6}^{-2} f(x)dx, \quad \int_{-4}^{0} f(x)dx, \quad \int_{0}^{3} |f(x)|dx, \quad \int_{1}^{6} f(x)dx, \quad \left|\int_{0}^{3} f(x)dx\right|, \quad \int_{6}^{2} f(x)dx, \quad \int_{3}^{3} f(x)dx$$

(b) What is the average of f over its domain?

2. (a) Draw several members of the family of antiderivatives of the function $f(x) = \frac{2}{x}$.

(b) Find the antiderivative of this family that goes through the point $(e, 0)$.

3. Sketch the region and find the area enclosed by $y = e^x$ and $y = 2$ on the interval $[-1, 0]$.

4. (a) What is the value of a one-time deposit of $1000 that is left in an account earning interest at a rate of 3% interest annually, compounded monthly, for 40 months? Set up but don't solve.

(b) What is the interest earned on the account in (a)?

5. (a) Set up the calculation to determine the principal one needs to deposit in a money market with an interest rate of 1% compounded continuously if it is to grow to $250,000 in 10 years.

(b) Set up but do not solve the fair market value of a continuous flow of money of $t + 200$ over 10 years, compounded continuously.

6. (a) Suppose you put $3,000 into a certificate of deposit that earns 5% annually, compounded continuously. How many years would it take for your money to double? *Show the work to get to the answer, even though it's a formula that is well-known in banking circles and economics.)*

   (b) Suppose $3,000 a year flows at a continuous rate into an account that pays 5%, compounded continuously. How long would it take for the account to reach $6,000?
   (I include this problem to show how must simplification can happen when you know your exponent properties! Also, to indicate how T is a number. Here we are solving for it, but usually it's the given!