

MATH 271, HOMEWORK 0  
DUE AUGUST 30<sup>TH</sup>

**Tell me a little bit about yourself!**

**Question 1.** Where did you grow up? Why did you choose Colorado State University?

**Question 2.** What is something interesting about yourself. What is a favorite hobby of yours?

**Question 3.** Why are you interested in chemistry? Do you have plans after you earn your degree?

**Question 4.** Honest answers appreciated here. Do you enjoy mathematics? Do you think it's hard? What do you hope to gain from this course?

**Now for some mathematics.**

**Problem 1.** Compute the following:

(a)  $\frac{d}{dx}(2x^7 - 3x^4 + 7)$ ;

(b)  $\frac{d}{dt}(e^{at} \sin(bt))$ ;

(c)  $\frac{d}{ds}(\tan(e^{s^2}))$ .

**Problem 2.** Compute the following:

(a)  $\int 2x^7 - 3x^4 + 7dx$ ;

(b)  $\int_{-1}^1 \cos(t)dt$ ;

(c)  $\int_0^1 e^{2y}dy$ ;

**Problem 3.** Find the point(s) of intersection of the parabola  $f(x) = 2x^2 + 2x + 2$  and the line  $g(x) = 4x + 4$ . Draw a picture and identify what's happening. (You can plot this on Desmos and print that out if you'd like, but do the algebra to find the solution by hand.)

**Problem 4.** Now take the same parabola  $f(x) = 2x^2 + 2x + 2$  and the line  $h(x) = 4x - 4$ . Draw a picture to show that these parabolas do not intersect. We can find "complex intersections" by doing the same algebra as the previous problem. Find these complex intersections. (*Hint: set up an equation whose roots would give you the intersections of these two curves.*)