

MATH 271, HOMEWORK 0  
DUE AUGUST 27<sup>TH</sup>

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

For the following five questions, write a message in our teams chat in the “About you” channel. Put your answer to all five questions in one single message please! This will make it easier to read.

**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 easy or hard? What do you hope to gain from this course?

**Question 5.** Why did you choose Math 271 and 272 as opposed to the physical sciences calculus sequence?

**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)  $\int_0^1 e^{xy}dy$ ;

**Problem 3.** Find the point(s) of intersection of the parabola  $f(x) = 2x^2 + 2x + 2$  and the line  $g(x) = 4x + 4$  using algebra. Plot this on Desmos to confirm your answer and include a picture of the two graphs.

**Problem 4.** Now take the same parabola  $f(x) = 2x^2 + 2x + 2$  and the line  $h(x) = 4x - 4$ . Plot this on Desmos and include a picture to show that the graphs of these two functions do not intersect in the plane. Explain why this must be true.

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.*)