* Our gear train efficiency should have been 98%. We initially had 0.983 = 0.94 and we cubed it because of inefficiency in the motor, gear 1, and gear 2. This was based on an initial, incorrect assumption that we had to multiply by the efficiency for every element in the system. We should have assumed the motor be 100% efficient, and the gear train to be 98% efficient.
  + Changing the efficiency would improve our performance because we could run the system at a slightly higher RPM (thus higher flow rate) while keeping the same load on the gear teeth.
* Our poster includes 2 calculations for screw torque, but only one of them is correct. The other one was a placeholder that we forgot to delete! The correct equation is shown below.



* In Appendix 3, we made a typo when we calculated the lead screw velocity v. We meant to use NScrew, not Tscrew. Regardless, the calculated value of 1.004 in/s is correct.



* We did not calculate our lead screw efficiency. While not a crucial element of our calculations, it might be significant. It is defined as:

* We intended to directly drive the lead screw with the motor to save on the cost of gears, but after consideration, we figured it would not be in the spirit of the assignment. We instead went with a 1:1 gear ratio, using cheap gears that are just strong enough to have a safety factor of 2.
  + We would also have to include a long sleeve to allow the lead screw to advance and retract. This would add extra cost and complexity to the design, but sleeves aren’t costed. This seemed to be a loophole that we didn’t want to exploit.
  + Since we noticed some teams direct driving, we will include our performance rating if we could exclude the cost of the gears. Our flow rate would be 200 ml/s, and our total cost would be $6.00+$2.68= $8.68 for the screw+nut.
  + Our performance rating would then be 200/8.68 = 23.04 mL/s$
* Our initial approach using a python script showed that we can get the best performance score by using the cheapest gears and keeping the flow rate fairly low. As gears become higher quality, their price increases disproportionately.
* Our final safety factor on the nylon gears was ~2.5 so that means we could have slightly increased our flow rate. We had initially set the flow rate to 200 ml/s because we knew the teeth would not withstand much force, and we could iterate from there. Since 2.5 was pretty close to 2, we didn’t want to spend the extra time to do those calculations all over again.