Aubrey Church

Lab 12

1) A factor of safety is a ratio of how much stronger a system is than it is actually required to be. For example, the simple hook had a FOS (factor of safety) of 5.258. Because 1.258 is greater than one, we would say it is very safe.

3) The maximum force the anchor pate can support while maintaining a FOS of 3.0 is ((36.5 \* 350) / 3) = 4,258.33

3b) Based on a FOS of 2.0, the maximum force the spider can support when…

* All the outer holes are fixed would be ((6.0967 \* 500) / 2.0) = 1,524.175
* Two outer holes are fixed would be ((1.68313 \* 500) / 2.0) = 420.7825
* One outer hole is fixed would be ((.70563 \* 500) / 2.0) = 176.4075

3c) We wanted to determine the max force that can be applied to each arm safely. I got an arm without the rib, but I did run into a complication. I could not import the correct material, so I just had to pick one at random. I picked nylon 6/10, with this material, the force was 4 and the FOS was 10.6087. So, to determine the max force, you solve for X in 10.6087 = X/4, or X = 10.6087 \* 4. X = 42.4348.