

Physics 200B, assignment 1 8/29/08

1. There are about 2000 Witt students. I'll assume on average one shower a day (some will take more, others may not shower each day). I estimate 50 gal (shower) by thinking about how fast the tub fills up if the drain is stopped while showering

toilet uses ~ 2 gal/flush; plus handwashing \rightarrow 15 gal/day

dishwashing (at home or CDR) \rightarrow 5 gal

toothbrushing, drinking, ice cubes \rightarrow 2 gal

for miscellaneous uses like watering lawns (most students don't have lawns!), filling fish tanks, washing cars \rightarrow 3 gal/day

total 75 gal/day \times 2000 students = 150 000 = 1.5×10^5 gal

order of magnitude 10^5 gal

convert to m^3 :

$$(1.5 \times 10^5 \text{ gal}) (231 \text{ in}^3/\text{gal}) \left(\frac{1}{6.102 \times 10^4} \text{ m}^3/\text{in}^3 \right) = 567 \text{ m}^3 = 5.67 \times 10^2 \text{ m}^3$$

order of magnitude 10^3 m^3