

Graded Problems for Homework 1, Math 3770, Fall 2008

September 9, 2008

Page 30, #34.

- Sample mean for the set U is 21.5454..., and for the set F is 8.56.
- Sample median for the set U is 17.0, and for the set F is 8.9.
- Trimmed mean for U is 17.0, and is 8.238461538... for F. The corresponding percentages are: We deleted the smallest and largest 9.1%, and the smallest and largest 6.7 percent in the other sample. The trimmed mean for U equals the median for U computed in part b; and the trimmed mean for F comes within about 7.4% of the median for F computed in part b.

Page 58, #18. To solve this problem you just need to compute the probability that the first draw did not result in a 75W bulb. This probability is plainly 1 minus the probability that the first bulb selected IS 75 W; so, the probability is

$$1 - 6/15 = 0.6.$$

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- This is $P_{3,8} = 8 \cdot 7 \cdot 6 = 336$.
- Assuming here that order is not important (the problem doesn't say whether it is or isn't), the answer is

$$\binom{30}{6} = 593775.$$

If order *is* important, then the answer is

$$P_{6,30} = 427518000$$

c. I am assuming here that order is not important. The answer is plainly (by the product rule for counting – select 2 of each type, and multiply possibilities)

$$\binom{8}{2} \binom{10}{2} \binom{12}{2} = 83160.$$

d. Again, assuming that order is not important, we have that all the $\binom{30}{6}$ subsets are equally likely to get chosen; so, the answer is

$$\frac{83160}{\binom{30}{6}} \approx 0.14.$$

e. The number of subsets of 6 wines, all of the same variety, is

$$\binom{8}{6} + \binom{10}{6} + \binom{12}{6} = 1162.$$

So the probability that all are of the same variety is

$$\frac{1162}{\binom{30}{6}} = 0.0019569\dots$$