1. Let $X_1, \ldots, X_{10}$ be independent random variables. The distribution of X_i is χ^2 with i degress of freedom. Find c such that

$$P\{X_1 + X_2 + X_3 + X_4 + X_5 \leq c(X_6 + X_7 + X_8 + X_9 + X_{10})\} = .95.$$

$$.95 = \mathbb{P}\left(\frac{\left(\frac{X_1 + X_2 + X_3 + X_4 + X_5}{15}\right)}{\left(\frac{X_6 + X_7 + X_8 + X_9 + X_{10}}{40}\right)} \leq \frac{40}{15} c \right)$$

$$\Rightarrow \frac{40}{15} c = F_{.95}(15, 40) \in (1.84, 2.01)$$

$$\Rightarrow c \in \left(\frac{15}{40} \cdot (1.84), \frac{15}{40}(2.01) \right)$$