STAT/ME 424 HW 3
(due 9 AM Tue, Oct 11, 2022, in Canvas)

1. Three brands of batteries are under study. It is suspected that the mean lives of the three brands are different. Five randomly selected batteries of each brand are tested with the following results:

Weeks of life		
Brand 1	Brand 2	Brand 3
100	76	108
96	80	100
92	75	96
96	84	98
92	82	100

   (a) Is there evidence to suggest that the mean lives of these brands of batteries are different? Test an appropriate hypothesis at level $\alpha = 0.05$.

   (b) Analyze the residuals from the data and state your conclusions.

   (c) Construct a 95 percent confidence interval for the mean life of battery brand 2.

   (d) Construct a 99 percent confidence interval for the difference between the mean lives of brands 2 and 3.

   (e) Based on the data, which of the 3 brands has the longest mean life?

   (f) If the manufacturer will replace without charge any battery that fails in less than 85 weeks, what percentage of batteries would the company expect to replace for the brand you chose in (e)?

2. Consider testing the equality of the means of two normal populations, where the variances are unknown but are assumed to be equal. The appropriate test procedure is the pooled t-test. Show that the square of the t-statistic is equal to the ANOVA F-statistic.