2. This problem is made up of two independent shorter parts.

a. To compare the *blood volumes* X and Y of paraplegic and normal men respectively, a sample of n=7 paraplegic men and a sample of m=10 normal men wee taken and their blood volumes measured. The results were:

X: 1612 1352 1456 1222 1560 1456 1924

Y: 1082 1300 1092 1040 910 1248 1092 1040 1092 1288

Choose between the Z and the only t-confidence interval we discussed, explain your choice, and obtain a 98% confidence interval for the mean difference $\mu_x - \mu_y$. Present a clear confidence statement and show your computations.

b. The cholesterol level of men ages 25-34 follows the distribution of Y = 80 + X where X has a Gamma distribution with $\alpha = 2$ *and* $\theta = 50$. *See Hogg pg 99-101 for the* θ *notation.* θ *is my* $1/\lambda$.

i. What are the mean and variance of the cholesterol level Y?

ii. Display the density of the cholesterol level Y with its support.

iii. Now concentrate on X alone and take θ as an unknown parameter. Show that $W = \left(\frac{2}{\theta}\right) X$ *is has a Gamma* $\left(\alpha = 2, \theta_W = \frac{1}{2}\right)$ *distribution which is a* χ^2 distribution with no unknown parameters! With how many degrees of freedom?

Continued on next page