(1) Stock and Watson, 4.1 parts (c) and (d).

Note: for part (d), you are asked to calculate the p-value associated with the two-sided test that the coefficient on class size equals zero. To do this, first calculate the value of the test statistic. The p-value is the probability that the standard Normal random variable (a good approximation to the sampling distribution of the standardized estimator with 100 observations) will exceed the absolute value of the test statistic. We discussed how this can be done in examples earlier in the semester. You will need to use Table 1 to perform these calculations. [Ideally, you would perform these calculations using the Student-t tables, but these are not presented in your book. Thus, you must use the Normal approximation]

(2) Stock and Watson, 4.2 part (c).

(3) Stock and Watson (5.3)

(4) Stock and Watson (5.4). Hint: When constructing the expected difference between the women, note that the difference will be of the form:

$$\Delta \equiv E(Wage|Betsy) - E(Wage|Sally) = 4\beta_{Age},$$

where $\beta_{Age}$ is the coefficient on the age variable. Your estimate of this difference is then

$$\hat{\Delta} = 4\hat{\beta}_{Age}.$$

When constructing a confidence interval for $\Delta$, first note that $\hat{\beta}_{Age}$ is a Normal random variable, and therefore $\hat{\Delta}$ is also a Normal random variable. Your 95 percent confidence interval will then be of the form:

$$\hat{\Delta} \pm 1.96\text{Std Dev}(\hat{\Delta}).$$

The Standard deviation can be calculated by first deriving the variance. Note:

$$\text{Var}(\Delta) = \text{Var}[4\hat{\beta}_{Age}] = 16\text{Var}(\hat{\beta}_{Age}).$$
Recommendation: I would also try exercise 5.1. To determine the level of significance, you will first need to calculate the t-statistics associated with the hypothesis that the coefficient equals zero. If the t-stat exceeds the critical value at the given level of significance, then the coefficient is said to be significant at that level.