8-10 (p.267)
(a) Need 95% confidence interval for the difference in the mean weight (lbs) between treatment and control groups $\mu_T - \mu_C$. We have independent samples.

$$\begin{aligned}(\bar{x}_T - \bar{x}_C) &\pm t_{0.025}^{(n_T-1)+(n_C-1)} s_p \sqrt{\frac{1}{n_T} + \frac{1}{n_C}} \\ 30 &\pm (2.45)(31.6)\sqrt{\frac{2}{4}} \\ (-24.8 &, \quad 84.8)\end{aligned}$$

(b) Money (in \$) made from treatment group (\$.90*weight-\$80): 217, 244, 280, 235
Money (in \$) made from control group (\$.90*weight): 261, 288, 306, 333
Need 95% confidence interval for the difference in the mean number of dollars between treatment and control groups $\mu_{TD} - \mu_{CD}$.

$$\begin{aligned}(\bar{x}_{TD} - \bar{x}_{CD}) &\pm t_{0.025}^{(n_T-1)+(n_C-1)} s_p \sqrt{\frac{1}{n_T} + \frac{1}{n_C}} \\ -53 &\pm (2.45)(28.5)\sqrt{\frac{2}{4}} \\ (-102.3 &, \quad -3.7)\end{aligned}$$

The supplement isn't likely to be profitable, since the difference between the average amount of money made using the supplement (treatment group) and the average amount of money made without the supplement (control group) is probably less than \$0.

8-16 (p. 273)
(a) Differences between standard yield and additive-influenced yield per plot: 2, -4, -6, 3, -4

Need a confidence interval for the mean difference in each plot (in quarts):

$$\begin{aligned}\bar{d} &\pm t_{0.025}^{4} \frac{s_d}{\sqrt{n}} \\ -1.8 &\pm (2.78)\sqrt{\frac{16.2}{5}} \\ (-6.8 &, \quad 3.2)\end{aligned}$$

(b) Since 1 plot is $\frac{1}{20}$ acre, we can just multiply the confidence interval endpoints by 20. (You could recalculate the interval after multiplying the yields by 20, but would reach the same answer. To see why, remember what happens to the mean and standard deviation of a variable when you multiply by a constant.) The 95% confidence interval for the mean difference in each acre (in quarts):

$$(-136, 64)$$

8-18 (p. 275)
(a) For 1980:

$$\begin{aligned} P &\pm 1.96\sqrt{\frac{P(1-P)}{n}} \\ 0.52 &\pm 1.96\sqrt{\frac{.52(.48)}{1500}} \\ (0.49 &, \quad 0.55) \end{aligned}$$

For 1985:

$$\begin{aligned} P &\pm 1.96\sqrt{\frac{P(1-P)}{n}} \\ 0.46 &\pm 1.96\sqrt{\frac{.46(.54)}{1500}} \\ (0.43 &, \quad 0.49) \end{aligned}$$

(b) Need a 95% confidence interval for the difference in the percentage of people in 1980 and 1985 who favored decriminalization of marijuana: $\pi_{1985} - \pi_{1980}$.

$$\begin{aligned} (0.46 - 0.52) &\pm 1.96\sqrt{\frac{.46(.54)}{1500} + \frac{.52(.48)}{1500}} \\ (-0.10 &, \quad -0.02) \end{aligned}$$

Between 1980 and 1985, it looks like the population percentage favoring acceptance of marijuana dropped.

8-32 (p. 286)
(a) It looks like the population means are probably different. However, before drawing any conclusions or using statistical procedures, I'd want to know how the samples were chosen.

(b) Treatment: 7, 8, 8, 9, 10, 10, 10, 10, 10, 11, 11, 11, 12, 12
Control: 2, 2, 3, 3, 4, 5, 6, 8, 8, 8, 9, 10, 10, 10

$$\begin{aligned} 3.6 &\pm (2.06)(2.4)\sqrt{\frac{2}{14}} \\ (1.7 &, \quad 5.5) \end{aligned}$$

It seems that the average score is higher for those in the treatment group.

(c) At least for this population ("relativly poor women with few social supports" - see Section 1-2), this study suggests the importance of early, more extensive contact between mothers and their newborns. thousand miles.