2.7

We consider the population of gas mileages for the GSX-50, with a normal distribution defined by a mean, $\mu = 31.5$ and standard deviation, $\sigma = 0.8$

a. $P(30.7 \leq y \leq 32.3) = 0.6826894809$
b. $P(29.1 \leq y \leq 33.9) = 0.9973000656$
c. $P(29.5 \leq y \leq 32.3) = 0.8351350606$
d. $P(31.0 \leq y \leq 31.3) = 0.1353082579$
e. $P(y \leq 29.5) = 0.0062096799$
f. $P(y \geq 29.5) = 0.9937903201$
g. $P(y \geq 33.4) = 0.0087744625$
h. $P(y \leq 33.4) = 0.9912255375$

2.8

Using the table, we compute as follows:

a. $z_{.05} = 1.644853626$
b. $z_{.02} = 2.053748911$
c. $z_{.01} = 2.326347877$
d. $z_{.005} = 2.575829303$

2.9

Using the table, we compute as follows:

a. $t^7_{.05} = 1.894578584$
b. $t^7_{.01} = 2.997951566$
c. $t^7_{.005} = 3.499483292$

2.10

Using the table, we compute as follows:

a. $F^{7,5}_{.05} = 4.8759$
b. $F^{5,2}_{.05} = 19.2964$

2.11

Using the table, we compute as follows:

a. $\chi^2_{.05}(3) = 7.815$
b. $\chi^2_{.01}(2) = 9.210$

2.16

a. Confidence Intervals,
   (a) $CI_{90} = (56.7, 58.9)$
   (b) $CI_{95} = (56.489, 59.111)$
   (c) $CI_{98} = (56.244, 59.356)$
   (d) $CI_{99} = (56.077, 59.523)$
b. Yes. Given that 60 feet is greater than the upper bound on the 95% interval, we may state that we are 95% confident that the mean is less than 60.
c. Yes. Given that 60 feet is greater than the upper bound on the 98% interval, we may state that we are 98% confident that the mean is less than 60.

2.17

We consider the shampoo problem, with $n = 6$, $\bar{y} = 15.7665$, $s = .1524$.

a. We shall test $H_0 : \mu = 16$ vs $H_a : \mu \neq 16$. Computing, we find a value, $p = 1.748 \times 10^{-4}$. Using the basis of $\alpha = .05$, we note that the process should be readjusted.
b. Using the test as before and the new basis $\alpha = .01$, we note that the process should still be readjusted.