HW 3

1) Sincich, Ex. 2.55.
2) Sincich, Ex. 2.62.
3) Sincich, Ex. 2.75 a).
4) Sincich, Ex. 2.76 b). Use the empirical rule.
5) Sincich, Ex. 2.86.
6) Sincich, Ex. 2.93 . Use Minitab. The data is in CEOPay.MTP.
7) Sincich, Ex. 2.96.
8) Sincich, Ex. 3.24. The text uses the notation $A^c$ for the complement of $A$.
9) Sincich, Ex. 3.41 and 3.42.
10) Sincich, Ex 3.52.
11) Sincich, Ex. 3.87.
12) Sincich, Ex. 3.120.

13) NASA estimates that the chance of a “critical-item failure” (that is, a catastrophic failure) is 2 in 126 for each mission.
   a) What is the probability that at least one of the 6 shuttle missions scheduled over the next two years results in a critical-item failure?
   b) What is the probability that at least one of the 10 shuttle missions scheduled over the next three years results in a critical-item failure?

14) Suppose that in the packaged-cereals industry, 29% of all vice presidents hold MBA degrees, 24% hold undergraduate business degrees, and 8% hold both. A vice president is to be selected at random.
   a) What is the probability that the vice president holds either an MBA or an undergraduate business degree (or both)?
   b) What is the probability that the vice president holds neither degree?
   c) What is the probability that the vice president holds an MBA degree but not an undergraduate business degree?

15) Suppose the probability that a child born in the US in 2010 will survive past age 80 is 20%, and the probability that he/she will survive past age 90 is 10%. For an 80-year-old who was born in the US in 2010, what is the probability of surviving past age 90?

16) A survey of workers in the two plants of a manufacturing firm includes the question “How effective is management in responding to legitimate grievances of workers?” In plant 1, 48 of 192 workers respond “poor”; in plant 2, 80 of 248 workers respond “poor”. An employee of the manufacturing firm is to be selected randomly. Let A be the event “worker comes from plant 1” and let B be the event “response is ‘poor’ ”.
a) Find $P(A)$, $P(B)$ and $P(A \cap B)$.
b) Are the events $A$ and $B$ independent?
c) Find $P(B \mid A)$ and $P(B \mid \overline{A})$. Are they equal?
d) Show that $P(\overline{B}) \neq P(\overline{B} \mid \overline{A})$. 