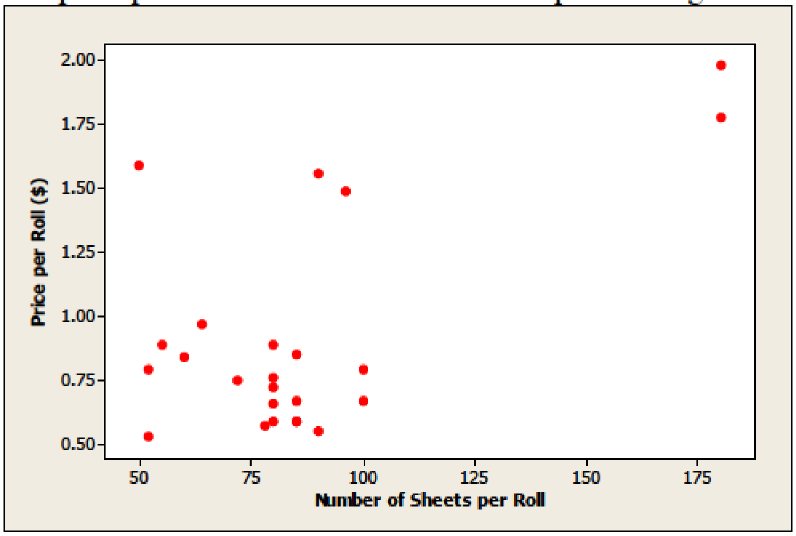
3.46 A scatterplot of price per roll versus number of sheets per roll is given here.



a. No.
b. No, as the number of sheets increases from 50 to 100, there is just a scatter of points, no real pattern. The price per roll jumps dramatically for the two brands having the largest number of sheets.
c. Paper towel sheets vary in thickness and size, both of which will affect the price.

4.8

a. $P(no\ repairs) = 1 - 0.15 - 0.1 - 0.05 = 0.7$
b. $P(at\ most\ 1\ repair) = P(no\ repairs) + P(1\ repair) = 0.7 + 0.15 = 0.85$
c. $P(at\ least\ 1\ repair) = 1 - P(no\ repairs) = 1 - 0.7 = 0.3$

4.10 $\{1,1\},\{1,2\},\{1,3\},\{1,4\},\{1,5\},\{1,6\},$
$\{2,1\},\{2,2\},\{2,3\},\{2,4\},\{2,5\},\{2,6\},$
$\{3,1\},\{3,2\},\{3,3\},\{3,4\},\{3,5\},\{3,6\},$
$\{4,1\},\{4,2\},\{4,3\},\{4,4\},\{4,5\},\{4,6\},$
$\{5,1\},\{5,2\},\{5,3\},\{5,4\},\{5,5\},\{5,6\},$
$\{6,1\},\{6,2\},\{6,3\},\{6,4\},\{6,5\},\{6,6\}$

4.16

a. $P(\text{Asian and Type O blood}) = 0.017$

b. $P(\text{not Type O blood} \mid \text{White}) = \dfrac{0.322 + 0.088 + 0.032}{0.802} = \dfrac{0.442}{0.802} = 0.5511$

c.

$$P\left[(\text{Type A or Type B blood}) \mid \text{Asian}\right] = P(\text{Type A blood} \mid \text{Asian}) + P(\text{Type B blood} \mid \text{Asian})$$
$$= \frac{0.012}{0.042} + \frac{0.01}{0.042} = 0.5238$$

d.

$$P(\text{neither Type A blood nor Type AB blood}) = P(\text{Type B blood or Type O blood})$$
$$= P(\text{Type B blood}) + P(\text{Type O blood})$$
$$= 0.126 + 0.462 = 0.588$$

4.26

a.

$$P(A) = P(\text{none} \cap \text{high}) + P(\text{little} \cap \text{high}) + P(\text{some} \cap \text{high}) + P(\text{extensive} \cap \text{high})$$
$$= 0.10 + 0.15 + 0.16 + 0.22 = 0.63$$
$$P(B) = P(\text{low} \cap \text{extensive}) + P(\text{medium} \cap \text{extensive}) + P(\text{high} \cap \text{extensive})$$
$$= 0.04 + 0.10 + 0.22 = 0.36$$
$$P(C) = P(\text{low} \cap \text{none}) + P(\text{low} \cap \text{little}) + P(\text{medium} \cap \text{none}) + P(\text{medium} \cap \text{little})$$
$$= 0.01 + 0.02 + 0.05 + 0.06 = 0.14$$

b. $P(A|B) = \dfrac{P(A \cap B)}{P(B)} = \dfrac{0.22}{0.36} = 0.611$

$$P(B|\bar{B}) = \frac{P(B \cap \bar{B})}{P(\bar{B})} = 0$$

$$P(\bar{B}|C) = \frac{P(\bar{B} \cap C)}{P(C)} = \frac{0.14}{0.14} = 1.0$$

c. $P(A \cup B) = P(A) + P(B) - P(A \cap B) = 0.63 + 0.36 - 0.22 = 0.77$;

$P(A \cap C) = 0$; $P(B \cap C) = 0$

4.29 Let D = event that the loan defaulted, R_1 = event that applicant is poor risk, R_2 = event that applicant is fair risk, R_3 = event that applicant is good risk.

$P(D) = 0.01$, $P(R_1|D) = 0.30$, $P(R_2|D) = 0.40$, $P(R_3|D) = 0.30$

$P(\bar{D}) = 0.99$, $P(R_1|\bar{D}) = 0.10$, $P(R_2|\bar{D}) = 0.40$, $P(R_3|\bar{D}) = 0.50$

$$P(D|R_1) = \frac{P(R_1|D)P(D)}{P(R_1|D)P(D) + P(R_1|\bar{D})P(\bar{D})} = \frac{(0.30)(0.01)}{(0.30)(0.01) + (0.10)(0.99)} = 0.0294$$