

Lesson 3.1.4

3-28. $P(\bar{B} | \bar{A}) = \frac{0.25}{0.70} = 0.357$

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

$$P(A \cap B) = P(B) \cdot P(A | B)$$

3-29. a. See diagram at right.

b. $P(G) = 0.075 + 0.60 = 0.675 = 67.5\%$

c. $P(\bar{W} | G) = \frac{0.60}{0.675} \approx 0.89 \approx 89\%$

	Good grade	Bad grade
Work (not study) (0.25)	0.075	0.175
No work (study) (0.75)	0.6	0.15
	0.675	0.325

3-30. a. Example: $P(< 18) = 0.15$, $P(4 \text{ to } 8 \text{ p.m.} | < 18) = 0.80$, $P(4 \text{ to } 8 \text{ p.m.} | \geq 18) = 0.30$

b.

	4 to 8 p.m.	Other	
< 18	$(0.15)(0.80) = 0.12$	0.03	0.15
≥ 18	$(0.85)(0.30) = 0.255$	0.595	0.85
	0.375	0.625	1

c. $P(\text{other} \cap \geq 18) = 0.595$

d. $P(< 18 | 4 \text{ to } 8 \text{ p.m.}) = \frac{0.12}{0.375} \approx 0.32$

3-31. See tables below. They are independent (not associated):

$$P(\text{Base Hit} | \text{Fastball}) \approx P(\text{Fastball}) \approx 0.25 \text{ or}$$

$$P(\text{Base Hit}) \cdot P(\text{Fastball}) \approx P(\text{Base Hit} \cap \text{Fastball}) \approx \frac{3}{32}$$

		Timmy		
		Fastball	Other pitch	
Brandon	Base hit	3	5	8
	No base hit	9	15	24
		12	20	32

		Timmy		
		Fastball	Other pitch	
Brandon	Base hit	25%	25%	
	No base hit	75%	75%	
		100%	100%	

3-32. a.

		OceanView	Not Ocean View	
Senior Not senior		$(0.60)(0.10) = 0.06$	0.04	0.10
		$(0.20)(0.90) = 0.18$	0.72	0.90
		0.24	0.76	1.00

b. $P(\text{Senior} | \text{OceanView}) = \frac{0.06}{0.24} = 25\%$

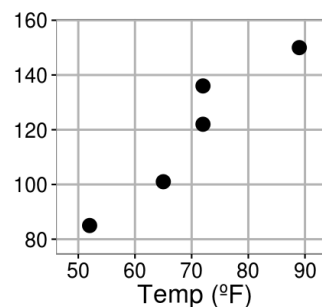
3-33. a. This is a positive, linear association of moderate-to-strong strength. See graph at right.

b. $\hat{c} = -10.96 + 1.85t$ where \hat{c} is the predicted number of fruit cups sold and t is the temperature.

c. The largest residual is the (72, 136) point, with a residual of 13.5. On that day, 13.5 more fruit cups were sold than predicted by Mary's model.

d. $S = 9.512$ cups. The typical point is 9.5 cups off from Mary's model. A reasonable range is S above and below the estimate. $-10.96 + 1.85(75) = 128$, so putting ≈ 10 above and below gives a range of values of about 118 to 138 fruit cups.

e. Collect more data, or work to get a better line of best fit.



3-34. a. mean = 28.3 minutes, median = 15 minutes

b. The median because the data is not symmetric, so the mean is more greatly impacted by the outlier of 120 minutes.

3-35. Correct answers may vary, however the following is a reasonable example of a comparison between the two populations: The distribution of okapi tongue lengths in the first population appears to be left (or negatively) skewed, while the shape of the data from the second population is right (or positively) skewed. A central okapi tongue length for population 1 is approximately 14 in greater than for population 2. Population 2 has a larger range of values at 20 in and a larger IQR with half of the okapi tongue lengths between 9 and 13 in. There are 3 outliers in population 1 and 2 outliers in population 2.