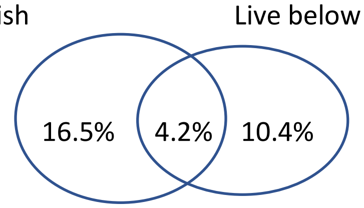
2.6
a) 0
b) 4/36
c) 1/36

2.8
a) No, living below the poverty line and speaking a foreign language are not disjoint. 4.2% fall into both categories.
b) Venn Diagram

Speak language other
English

Live below poverty line



c) 10.4% live below the poverty line and only speak English
d) 10.4% + 4.2% + 16.5% = 31.1%
e) 1-0.311 = 68.9%
f) P(LBP) x P(SLOE) =? P(LBP and SLOE)
0.146 x 0.207 = 0.0302 <> 4.2%
No, the events are not independent.

2.20
a) $P(M_{bl}$ or $F_{bl}) = P(M_{bl}) + P(F_{bl}) - P(M_{bl}$ and $F_{bl})$ = (114+108-78)/204 = 144/204 = 70.6%
b) $P(M_{bl} \mid F_{bl})$ = (78/204)/(108/204) = 72.21%
c) $P(M_{br} \mid F_{bl})$ = (19/204)/(108/204) = 17.59%
$P(M_g \mid F_{bl})$ = (11/204)/(108/204) = 10.19%
d) Yes, it does appear that the eye colors of male respondents and their partners are independent.
72.21% + 17.59% + 10.19% = 100% (slightly off from rounding)
The probabilities are conditioned on the same information (Female partner having blue eyes) and they sum to 1. This indicates independence.

2.30
a) (28/95)*(67/94) = 21%
b) (72/95)*(28/94) = 22.6%
c) (72/95)*(28/95) = 22.3%
d) When the sample size is only a small fraction of the population, observations are nearly independent even when sampling without replacement.

2.38

i (Scenario)	0 (no bag)	1 (1 bag)	2 (2 bags)	Total
x_i	$0	$25	$60	
$P(X= x_i)$	0.54	0.34	0.12	
$x_i \times P(X= x_i)$	0	$8.50	$7.20	$15.70
$x_i - \mu$	-15.20	9.30	44.30	
$(x_i - \mu)^2$	231.04	86.49	1962.49	
$(x_i - \mu)^2 \times P(X= x_i)$	124.76	29.4	235.5	389.66

a) The average revenue per passenger is $15.70. The variance is 389.66, therefore the standard deviation is the sqrt of 389.66 = $19.74.
b) 120 * $15.70 = $1,884 with a standard deviation of $19.74 assuming that the distribution is normally distributed. I am not sure this is justified since it seems to be right skewed.

2.44

a) The distribution is fairly symmetric and unimodal.
b) 2.2+4.7+15.8+18.3+21.2 = 62.2%
c) P(<50k and F) = P(<50k) x P(F) = .622*.41 = 25.5% assuming these are independent
d) The assumption of independence is not valid seeing as the actual probability of P(<50k and F) is much higher than part c.