Solutions to the Additional Problems

1. (a) b = 1.22

   (b) a = 0.45

2. 6 (by 68-95-99.7 Rule)

3. 0.9108 (Within 1.7 standard deviations means that the z-score is 1.7 each way. Remember, z counts standard deviations. This question is asking what the probability of being between -1.7 and 1.7 is on the z-bell curve.)

4. (a) 0.9345 (z=1.505 rounds to 1.51)

   (b) 0.6879 (z= -1.35 and z= 0.76)

   (c) 0 (there is no area to shade!)

   (d) 11.1036 seconds

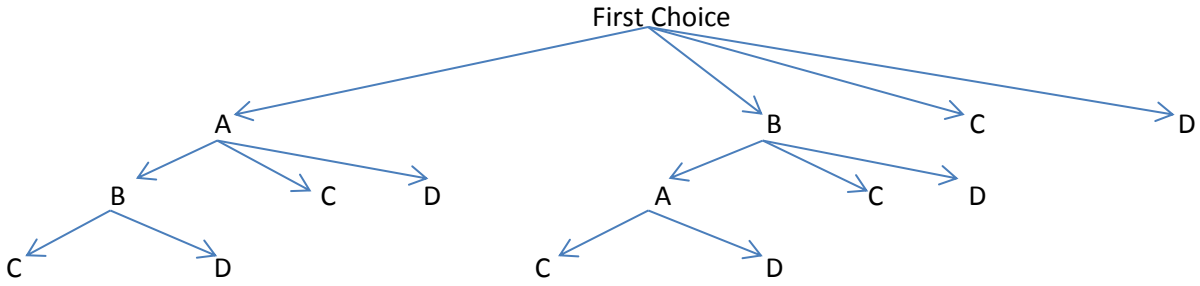
   (e) The runner did best in the 200-metre race. (Note that the LOWER the time the better (lowest time wins the race). Thus, the LOWEST z-score is best. The z-scores are, respectively, -1.26, -1.56, and -0.92.)

   (f) 25.17 seconds (To do equally well, they must get the exact same z-score in both races. Z=1 for the 100-metre race, so find the X-score for the 200-metre race that also has a z-score of 1.)

5. 64 (You are given the percentage. Climb up from the bottom of the X-bell curve ladder to solve sigma, the missing standard deviation.)

6. {C, D, AC, AD, ABC, ABD, BC, BD, BAC, BAD}

   Use a tree diagram here, since you keep choosing until you get a desired result. Which is to say, keep picking a book until you get C or D (a statistics book). Note that I am making my tree diagram vertically.



7. (a) {HHH, HHT, HTH, HTT, THH, THT}

   (b) {TTH} is the only event in "A and B"

   (c) {HTT, THT, TTH, TTT} are in "A or B"

8. (a) $P(M_4 \text{ and } G_1) = 40/1000 = 0.04$

   (b) $P(G_2) = (104+305+57+54)/1000 = 520/1000 = 0.52$

   (c) $P(G_2 \text{ or } M_1) = (104+305+57+54+129)/1000 = 649/1000 = 0.649$

9. Sample Space is {TRP, LRP, TCP, LCP, TRJ, LRJ, TCJ, LCJ}

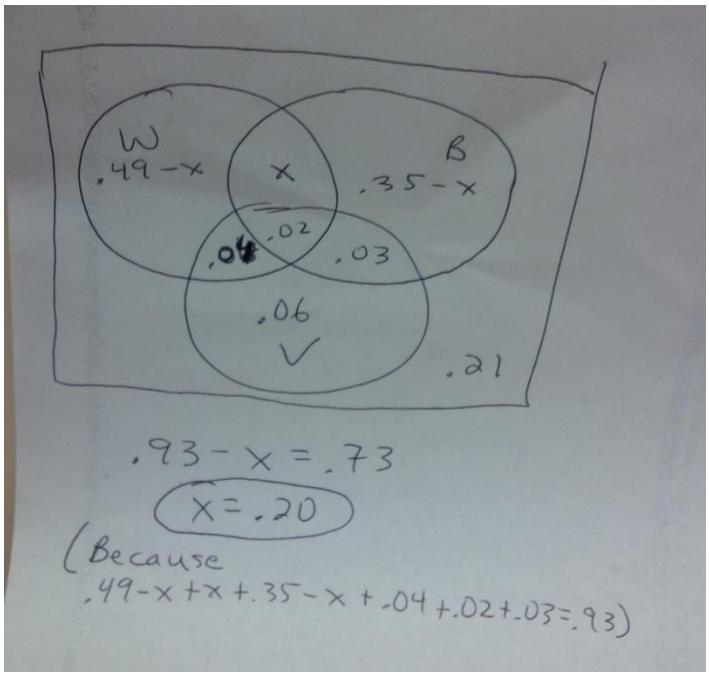
Outcome	TRP	LRP	TCP	LCP	TRJ	LRJ	TCJ	LCJ
Probability	0.144	0.096	0.336	0.224	0.036	0.024	0.084	0.056

   (a) 8

   (b) 0.144+0.096+0.224+0.024+0.036+0.024 = 0.58 (Could also do P(L)+P(R)–P(L and R) where P(L and R) = P(L)*P(R) since each game is independent.)

   (c) 0.224+0.024+0.084 = 0.332 (exactly two of L, C or J)

10. Similar to your question on Assignment 3. Three-circle Venn. You will have to put an x in the missing part of the "W and B" section. You will have a "0.49 – x" in the missing part of the W circle and "0.35 – x" in the missing part of the B circle. You should discover that x=0.14.



(a) 0.15

(b) 0.35

(c) 0.6

(d) 0.15

(e) 0.64

(f) 0.1841 (Binomial; n=17, p=0.55, k=10)

11. 0.0262 (x-bar bell curve with z=1.94)

12. 0.7549 (Divide the total of 60 by 3 to get a sample mean of 20 minutes per puzzle; then find probability x-bar > 20 using x-bar bell curve; z = -0.69.)

13. (a) The distribution of x-bar is approximately normal since n is large by Central Limit Theorem. The mean of x-bar = mu = 15 and the standard deviation of x-bar = sigma/square root n = 4/10 = 0.4.

    (b) Impossible to calculate. The sample mean is not normally distributed since the sample size is so small (n=4) and the original population is not normal (it is triangular).

14. 0.0384 (Since n is large (n=50) we can assume the sample mean has an approximately normal distribution. FIRST, take the given Total ($900) and divide by n (50) to get the sample mean. We want probability that x-bar is less than $18. Use the x-bar bell curve. Z = -1.77)