Economics 250   **Exercise 2**

Answer Guide

1. (a) 6 (b) 2.0494

2. (a) 2.28

(b) The variance is 0.5416 so the standard deviation is 0.7359.

(c) The covariance is 0.2496.

(d) The conditional mean is 2.5651

(e) The conditional variance is 0.3327 so the conditional standard deviation is 0.5768.

3. (a) The mean is 8%. If the returns are independent then the variance of the sum is $0.25(12.25) + 0.25(1.44) = 3.4225$ so the standard deviation is 1.85 percent.

(b) The mean is still 8%. With a correlation of 0.5 the covariance is $0.5(1.2)(3.5) = 2.1$, so the variance is $3.4225+2(0.5)(0.5)(2.1) = 4.4725$ so the standard deviation is 2.1148.

4. (a) $P(X>8)=(20-8)/(20-0)=12/20=0.60$ (b) $P(10<X<15)=(15-10)/(20-0)=5/20=0.25$

(c) The range is a total of 20 minutes. 70% of the time, you should be called in before you wait 14 minutes.

5. $P(X>k) = 0.90 \Rightarrow P[Z>(k - 17.2)/3.1] = 0.90$ $(k - 17.2)/3.1 = -1.28, \Rightarrow k = 13.23$ minutes.

(Note: -1.28 is the closest value in the table; you can see that the precise value will be just below that, so if you find the answer using the exact value found with a calculator, then that also would be correct.)

6. (a) 80.12 (b) 81.58 (c) 68.42

(Note: For the 90th percentile of Z you can use 1.28 from Table 1 or the exact value found with a calculator, which will be slightly larger. For the 95th percentile of Z you can average the values in the table to get 1.645. So for the 5th percentile you would use -1.645.)

7. 9.875

8. (a) 720   20.875

   (b) 0.4   0.01155

   (d) 0.1685

(Note: The exact cutoff point for Z is -0.9622 so we used the closest value in Table 1 which was 0.96. If you used the exact probability you will get a slightly different amswer.)

   (e) 692.02 so 692

(Note: This uses -1.34 which is the closest value in Table 1.)