AP Stats
Chap 15 Handout   Name _____ Pd _____

Show all necessary work and place your answers on the spaces provided.

1. A biology professor responds to some student questions by email. The probability model below
    describes the number of emails the professor may receive from students during a day.

emails received	0	1	2	3	4	5
probability	0.05	0.10	0.20	0.25	0.30	0.10

    a. How many emails should the professor expect to receive each day?   1a. _____

    b. What is the standard deviation?   b. _____

    c. If it takes the professor an average of ten minutes to respond to each email,   c. _____
        how much time should the professor expect to spend responding to
        student emails each day?

2. The American Veterinary Association claims that the annual cost of medical care for dogs average
    $100 with a standard deviation of $30, and for cats averages $120 with a standard deviation of
    $35.

    a. Find the expected value for the annual cost of medical care for a person   2a. _____
        who has one dog and one cat.

    b. Find the standard deviation for the annual cost of medical care for a person   b. _____
        who has one dog and one cat.

    c. Suppose that a couple owns four dogs. Find the expected value for the   c. _____
        annual cost of medical care for the couple's dogs.

    d. Find the standard deviation for the annual cost of medical care for the   d. _____
        couple's dogs.

3. A fast food restaurant just leased a new freezer and food fryer for three years. The service contract for the freezer offers unlimited repairs for a fee of $125 a year plus a $35 service charge for each repair needed. The restaurant's research suggested that during a given year 80% of these freezers need no repairs, 11% needed to be services once, 5% twice, 4% three times, and none required more that three repairs.

   a. Find the expected number of repairs this kind of freezer is expected to need each year. Show your work.

   3a. _____

   b. Find the standard deviation of the number of repairs each year.

   b. _____

   c. What are the mean and standard deviation of the restaurant's annual expense for the service contract?

   c. _____

   d. How many times should the restaurant expect to have to get this freezer repaired over the three-year term of the lease?

   d. _____

   e. What is the standard deviation of the number of repairs that may be required during the three-year term of the lease? On what assumption does your calculation rest? Do you think this assumption is reasonable?

   e. _____

   f. The yearly service contract for the food fryer estimates a mean annual cost of $140 with a standard deviation of $40. What is the expected value and standard deviation of the total cost for the service contracts for the freezer and the food fryer?

   f. _____

   g. Which service contract should the restaurant expect to cost more each year? How much more? With what standard deviation?

   g. _____