1. Find a February 7 issue of *The Chicago Maroon* and answer the following questions based on the article on *StreetWise*.
   (a) Given that *StreetWise* is a weekly paper, what are the total annual sales of the paper?
   (b) Using the figures provided in the article on the number of vendors, the cost of the paper to vendors and the selling price of the paper, find the average annual income of a vendor.
   (c) How does your result in (b) compare to the figures given in the article for vendor incomes? Discuss possible reasons for any discrepancy you find.
   (d) If the circulation figures given are correct, what is the maximum possible number of vendors who can earn at least $5,000 annually?
   (e) Do you think the median vendor income is greater than, nearly the same, or less than the average vendor income? Explain.

2. Suppose, as in class, that the prevalence of breast cancer is 1%, the sensitivity of mammograms is 90% and the specificity is 95%. Answer the following questions on the average costs of breast cancer screening.
   (a) Let us suppose that the direct cost of a mammogram is $200 (this includes the cost of the mammogram itself as well as lost wages and transportation costs associated with taking the exam). In addition, let us suppose that the cost of true positives and true negatives are 0, the cost of a false negative is $250,000 and the cost of a false positive is $10,000. Find the average total cost of a mammogram.
   (b) What would be the average cost of not screening? Note that in this case the $200 direct cost for each woman would disappear and we would be acting as if we had an “exam” that classified every woman as negative, so that there would be neither true nor false positives.
   (c) Based on this analysis, are annual mammograms cost effective? Discuss at least two issues that would have to be addressed to develop an analysis along these lines that one could take seriously and how they might be addressed.

3. Consider the example described in class in which two balls are drawn at random consecutively from an urn containing two white balls and two black balls. Let $X$ be the number of black balls selected.
   (a) What are the possible values for $X$? What are the probabilities that $X$ takes on each of these values?
   (b) Find the mean of $X$.
   (c) Compare your answer in (b) to the mean of a Binomial(2, 1/2) random variable. Is it bigger, smaller or the same? If it is different, explain the direction of the difference.