Note: These problems are designed for practice during a 50 minute recitation.

1. **Easy** problems: expected to be solved in *5 min*.
2. **Medium** problems: expected to be solved in *30 min*.
3. **Hard** problems: expected to be solved in *15 min*.

During the recitation, you may discuss the problems with your peers and the TA. Please control your volume and don’t annoy others. An electronic copy of these problems and solutions will be posted on the following URL: <http://cs.utsa.edu/~btang/pages/teaching.html>.

**Questions**:

1. (Easy, 5 min) Find the probability of (a) 2 or more heads, (b) fewer than 4 heads, in a single toss of 6 fair coins. (Textbook [S3] Page 145: 4.62, hint: Binomial Distribution)   
   ***Answer***:

   2. .
2. (Medium, 10 min) Find the probability of getting a total of 11 (a) once, (b) twice, in two tosses of a pair of fair dice. (Textbook [S3] Page 145: 4.65, hint: Binomial Distribution)  
   ***Answer***:
   1. .
   2. .
3. (Medium, 10 min) Find (a) the mean, (b) the standard deviation on an examination in which grades of 70 and 88 correspond to standard scores of -0.6 and 1.4, respectively. (Textbook [S3] Page 145: 4.73, hint: Normal Distribution sample solution p124: 4.14)  
   ***Answer***:   
   Method 1: The density function for Normal Distribution is:  
     
   We know that . Solve the density function with these values. The result is   
   Method 2: 70 in standard units , 88 in standard units .
4. (Medium, 10 min) Find if , where z is normally distributed with mean 0 and variance 1. (Textbook [S3] Page 145: 4.78, hint: Normal Distribution)  
   ***Answer***: Because , so, by symmetric feature, is a negative number. Lookup the table in Appendix C: Areas under the Standard Normal Curve from 0 to z. . So, by symmetric feature, . Guess .
5. (Hard, 15 min) A bag contains 1 red and 7 white marbles. A marble is drawn from the bag, and its color is observed. Then the marble is put back into the bag and the contents are thoroughly mixed. Using (a) the binomial distribution, (b) the Poisson approximation to the binomial distribution, find the probability that in 8 such drawings, a red ball is selected exactly 3 times. (Textbook [S3] Page 146: 4.92)  
   ***Answer***:
   1. .
   2. .