CS 333202: Probability and Statistics
HW2 part 2

1. $P\{X = 1\} = 1/2$

   $P\{X = 2\} = \frac{5}{10}\frac{5}{9} = \frac{5}{18}$

   $P\{X = 3\} = \frac{5}{10}\frac{4}{9}\frac{5}{8} = \frac{5}{36}$

   $P\{X = 4\} = \frac{5}{10}\frac{4}{9}\frac{3}{8}\frac{5}{7} = \frac{10}{168}$

   $P\{X = 5\} = \frac{5}{10}\frac{4}{9}\frac{3}{8}\frac{2}{7}\frac{5}{6} = \frac{5}{252}$

   $P\{X = 6\} = \frac{5}{10}\frac{4}{9}\frac{3}{8}\frac{2}{7}\frac{1}{6} = \frac{1}{252}$

   $P\{X = 7\} = 0$

   $P\{X = 8\} = 0$

   $P\{X = 9\} = 0$

   $P\{X = 10\} = 0$

2. (a) $n - 2i, i = 0, 1, ..., n$

   (b) $P\{X = 3\} = 1/8$

   $P\{X = 1\} = 3/8$

   $P\{X = -1\} = 3/8$

   $P\{X = -3\} = 1/8$

3. (a) $p(X = 6) = 1 - (\frac{5}{6})^2 = \frac{11}{36}$

   $p(X = 5) = 2(\frac{1}{6})(\frac{4}{6}) + (\frac{1}{6})^2 = \frac{9}{36}$

   $p(X = 4) = 2(\frac{1}{6})(\frac{3}{6}) + (\frac{1}{6})^2 = \frac{7}{36}$

   $p(X = 3) = 2(\frac{1}{6})(\frac{2}{6}) + (\frac{1}{6})^2 = \frac{5}{36}$

   $p(X = 2) = 2(\frac{1}{6})(\frac{1}{6}) + (\frac{1}{6})^2 = \frac{3}{36}$

   $p(X = 1) = \frac{1}{36}$

   (b) $p(Y = 5) = \frac{1}{36}$

   $p(Y = 4) = \frac{2}{36}$

   $p(Y = 3) = \frac{3}{36}$

$p(Y = 2) = \frac{4}{36}$
$p(Y = 1) = \frac{5}{36}$
$p(Y = 0) = \frac{6}{36}$
$p(Y = -j) = p(Y = j), j > 0$