MATH 464 (THEORY OF PROBABILITY)
HOMEWORK 4

FALL 2017

Due on: Thursday 09-21-2017.

(1) Three couples that were invited to dinner will independently show up with probabilities 0.9, 0.8, and 0.75. Let N be the number of couples that show up. Calculate the probability that $N = 3$ and that of $N = 2$.

(2) Suppose we roll two fair 6-sided dice. Let X be a random variable corresponding to the minimum value of the two rolls. Find the probability mass function f_X.

(3) Let X be a discrete random variable on the probability space $(\Omega, \mathcal{F}, \mathbb{P})$, defined by its probability mass function given in the following table:

x	-4	-1	0	2	4	5	6
$f_X(x)$	0.15	0.2	0.1	0.1	0.2	0.2	0.05

Find the following:
(a) $\mathbb{P}(X \text{ is even})$ (here we regard 0 as even)
(b) $\mathbb{P}(1 \leq X \leq 8)$
(c) $\mathbb{P}(X = -4 \mid X \leq 0)$
(d) $\mathbb{P}(X \geq 3 \mid X > 0)$

(4) For what value of c the function p, defined by

$$p(k) = \begin{cases} \dfrac{c}{k(k+1)} & \text{if } k = 1, 2, \ldots, \\ 0 & \text{otherwise,} \end{cases}$$

a probability mass function?