MATH 320: In-Class 1

Answer all questions. Show your work where necessary.

1. A computer runs a part of a bigger machine. If the computer or the part fails, then the machine does not work. Possible outcomes, where each is an ordered pair (such as (C_f, P_f)) involve the following:

C_f: Computer fails C_w: Computer works as expected
P_f: Part fails P_w: Part works as expected

Write the outcomes in each of the following events:

(a) Sample space $S =$

(b) Part fails $A =$

(c) Machine fails $F =$

(d) $\sim F =$

2. An experiment consist of tossing a coin and then rolling a 6-sided die. An outcome is an ordered pair, such as $(H, 3)$. Let A be event that the coin shows heads and B be the event the number on the die is greater than four. List the outcomes in each of the following:

(a) Sample space $S =$

(b) $B =$

(c) $A \cap B =$

(d) $\sim(A \cap B) =$

(e) $\sim(A \cup B) =$

3. In an experiment of tossing two 4-sided dice, we have the following events:

- $E =$ sum of dice is 4
- $F =$ both dice show the same number
- $G =$ both die show a number ≥ 3

List the outcomes in each of the following events:

(a) $E \cap F =$

(b) $E \cup F =$

(c) $E \cup (F \cap G) =$

(d) $E \cap (F \cup G) =$