

I pledge my honor that I have neither given nor received aid on this exam.

NAME

Z NUMBER

Show all work (attach work pages). Write on one side of page only. Write answers in space provided. Staple in upper left-hand corner.

Consider four identical-looking dice. Three of the dice are ordinary fair dice (six equally-likely faces, numbered $1, 2, \dots, 6$), but the fourth die is "loaded" (the face that ordinarily has a 1 has a 6 instead; that is, the loaded die has two 6's, on opposite faces). Fran chooses two dice at random, and Ron gets the remaining two dice.

Suppose that Fran and Ron roll their dice simultaneously.

1. Find the probability that Fran rolls a 12.

1

2. Find the probability that Ron rolls a 12.

2

3

3. Find the probability that Fran rolls a 12 and Ron rolls a 12.

4

5

4. Find the probability that somebody rolls a 12.

6

Suppose that Fran rolls her two dice again.

5. Find the probability that Fran rolls a 12 twice in a row (that is, Fran's first roll is a 12 and Fran's second roll is a 12).

6. Find the probability that Fran was using the loaded die if she rolled a 12 twice in a row.