

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. No credit for an answer not supported by a calculation or an explanation. Staple in upper left-hand corner.

Fran has two 52-card decks of ordinary playing cards. She shuffles each deck, and surreptitiously removes the Queen of Spades from one of the decks (which now therefore contains 51 cards). Ron chooses a deck at random, and deals himself 2 cards (call them R_1 and R_2), and Fran deals herself 1 card (F_1) from the remaining deck.

1. Find the probability that R_1 is the Queen of Spades.

1

2. Find the probability that F_1 is the Queen of Hearts.

2

3. Find the probability that R_1 is the Queen of Spades and F_1 is the Queen of Hearts.

3

4. If R_1 was not the Queen of Spades, find the probability that Ron's deck does not contain the Queen of Spades (because it had been removed by Fran).

4

5. If R_1 was not the Queen of Spades, find the probability that R_2 is the Queen of Spades.

5

6

6. Find the probability that $F_1 = R_1$.