

*Include your name, the homework number, and your complete work, including any steps used to obtain the answer. Submit a hard copy - written out legibly or printed - before class.*

### Section 7.1

4. What is the probability that a randomly selected day of a leap year (with 366 possible days) is in April?

12. What is the probability that a five-card poker hand contains exactly one ace?

20. What is the probability that a five-card poker hand contains a royal flush, that is, the 10, jack, queen, king, and ace of one suit?

28. In a superlottery, a player selects 7 numbers out of the first 80 positive integers. What is the probability that a person wins the grand prize by picking 7 numbers that are among the 11 numbers selected at random by a computer.

### Section 7.2

2. Find the probability of each outcome when a loaded die is rolled, if a 3 is twice as likely to appear as each of the other five numbers on the die.

6. What is the probability of these events when we randomly select a permutation of  $\{1, 2, 3\}$ ?

a) 1 precedes 3.

b) 3 precedes 1.

c) 3 precedes 1, and 3 precedes 2.

24. What is the conditional probability that exactly four heads appear when a fair coin is flipped five times, given that the first flip came up tails?

28. Assume that the probability a child is a boy is 0.51 and that the sexes of children born into a family are independent. What is the probability that a family of five children has

a) exactly three boys?

b) at least one boy?

c) at least one girl?

d) all children of the same sex?

### Section 7.4

2. What is the expected number of heads that come up when a fair coin is flipped 10 times?

8. What is the expected sum of the numbers that appear when three fair dice are rolled?

16. Let  $X$  and  $Y$  be the random variables that count the number of heads and the number of tails that come up when two fair coins are flipped. Show that  $X$  and  $Y$  are not independent.