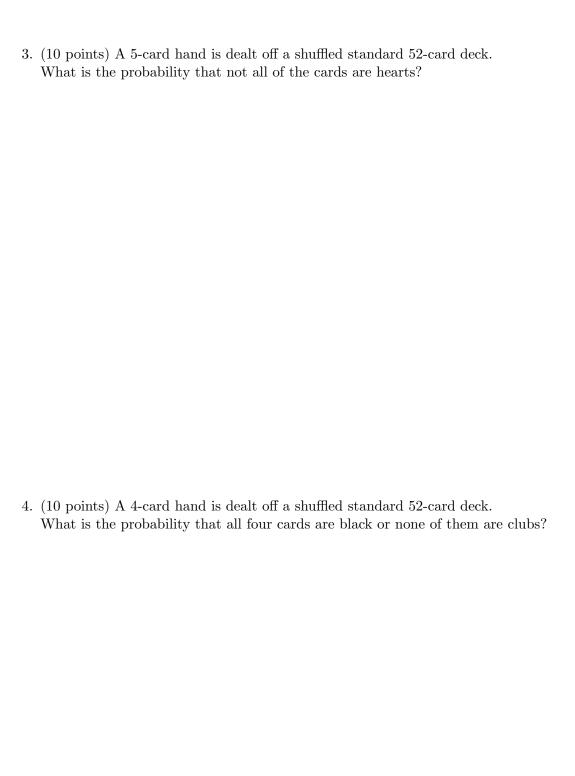
MATH 211	Test $\#2 \diamondsuit$	April 11, 2023
Name:	R. Hammack	Score:

**Directions** You must show your work to get full credit. This test is closed-book and closed-notes. No calculators or other electronic devices are allowed. Simplify your answers if it is easy to do so, but you may leave complex answers unsimplified. All you will need is something to write with.

1. (10 points) You have two fair 6-sided dice, a black one and a white one. You toss them both. Write out the sample space S, and circle the event  $E \subseteq S$  of the two dice adding to 5. Find p(E).

2. (10 points) Toss a coin 12 times in a row.

What are the chances that exactly four of the tosses are tails?



5. (10 points) A box contains 5 red balls, 4 green balls and 1 blue ball. You reach in and remove two
balls, one after the other. What is the probability that one of the balls is blue?

6. (10 points) Suppose  $A, B \subseteq S$  are two events in the sample space S of some experiment. Suppose p(A) = 25%, p(A|B) = 50% and p(B|A) = 40%.

(a) 
$$p(\overline{A}) =$$

(b) Are A and B independent or dependent?

(c) 
$$p(A \cap B) =$$

(d) 
$$p(B) =$$

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

- 7. (10 points) A woman has four children (no twins). Consider the following events:
  - A: She has two girls and two boys.
  - B: Her oldest child is a boy.

Are events A and B independent, dependent, or is there not enough information to say for sure?

8. (10 points) Give the output for the following chunk of pseudocode.

```
\begin{array}{l} y := 2 \\ \textbf{for} \quad n := 1 \quad \textbf{to} \quad 5 \ \textbf{do} \\ \mid \quad y := 10 - y \\ \quad \textbf{output} \ y \\ \textbf{end} \\ \textbf{output} \ y \end{array}
```

9. (10 points) What does the following algorithm do?

```
Algorithm
Input: A natural number n \in \mathbb{N}
Output: ?
begin

| while (n > 1) do
| n := n - 2
| end
| if (n = 1) then
| output "Yes"
| else
| output "No"
| end
| end
```

10. (10 points) Write an algorithm whose input is a positive integer n and whose output is the first n terms of the sequence  $3, 6, 12, 24, 48, 96, \ldots$