

## Homework 2

Math 262

Write your solutions to the following problems and turn them in to the homework mailbox (RMS level 3, near the fireplace) by 5:00pm on Friday, February 17.

### Warm-Up

Read “You can find the secret to doing mathematics in a tubeless bicycle tire” (*Devlin’s Angle*, December 13, 2016, <http://bit.ly/2kNjfeS>) and answer the following questions: *According to Devlin, what is the secret to doing mathematics? How does this relate to the growth mind-set from the article you read last week? How might Devlin’s secret be relevant in this course?*

### Book Problems

- Section 1.2 #15, 24 (pages 18–20)
- Section 1.3 #31, 32, 33, 34, 39 (pages 31–33)

### Additional Problems

1. There are  $n$  socks (3 of which are red) in a drawer. What is the value of  $n$  such that when 2 of the socks are chosen, the probability that both are red is  $\frac{1}{2}$ ? What assumptions are being made?
2. A poker hand consists of 5 cards dealt from a standard 52-card deck.\* If it is assumed that all poker hands are equally likely, what is the probability of being dealt:
  - (a) a flush? (A hand is said to be a flush if all 5 cards are of the same suit.)
  - (b) one pair? (This occurs when the cards have ranks  $a, a, b, c, d$ , where  $a, b, c$ , and  $d$  are all distinct.)
  - (c) two pairs? (This occurs when the cards have ranks  $a, a, b, b, c$ , where  $a, b$ , and  $c$  are all distinct.)
  - (d) three of a kind? (This occurs when the cards have ranks  $a, a, a, b, c$ , where  $a, b$ , and  $c$  are all distinct.)
  - (e) four of a kind? (This occurs when the cards have ranks  $a, a, a, a, b$ , where  $a$  and  $b$  are distinct.)

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\*A standard 52-card deck consists of 13 cards of each of the four *suits*: clubs ( $\clubsuit$ ), diamonds ( $\diamondsuit$ ), hearts ( $\heartsuit$ ), and spades ( $\spadesuit$ ). Within each suit, each of the 13 cards has a different *rank*: ace, king, queen, jack, 10, 9,  $\dots$ , 2.