

## Math 300 – Homework Set 6

Due Thursday, April 10

1. Please read Chapter 4, focusing especially on 4.1 and 4.3.
2. From chapter 5: # 24, 32, 40
3. From chapter 4: # 10, 12, 14, 18, 20 (find which values of  $n$  makes this true and prove it), 42
4. Here is an open-ended question. Take a look at questions # 11, 12, 13 on page 104. Can you make any conjectures about the formula for the sum

$$1^5 + 2^5 + \cdots + n^5$$

as a function of the positive integer  $n$ ? What about changing the exponent to an arbitrary positive integer  $k$ . In other words, can you make any conjectures about the sum

$$1^k + 2^k + \cdots + n^k$$

for general  $k \in \mathbb{N}$ ? Do some experimenting and use your intuition from the patterns that seem to be holding for  $k = 1, 2, 3$ , or 4. I'm not necessarily looking for the formula itself. Instead I'm looking for anything reasonable that you can say about the formula.

5. From Problem Set 4: # 49, 77