

# MTH 320: Homework 1

Due: January 18, 2019

1. Send me an e-mail introducing yourself. Let me know if you like to be called something other than your registrar listing, and anything you think I should know about your background.
2. Read Chapter 1 and Appendix A, and pages 509-511 of Appendix B in Hungerford.
3. Let  $A$ ,  $B$ , and  $C$  be sets. Verify the following properties:

(a)  $A \cup (B \cup C) = (A \cup B) \cup (A \cup C)$

(b)  $A \cap (B \cup C) = (A \cap C) \cup (A \cap B)$

(Remember that to show that two sets  $S$  and  $S'$  are equal, you need to show that  $S \subseteq S'$  and  $S' \subseteq S$ .)

4. Consider the following sets:

$$A = \{2x : x \in \mathbb{Z}\} \qquad A' = \{x \in \mathbb{Z} : 4|x^2\} \qquad A'' = \{x \in \mathbb{Z} : (-1)^x = 1\}$$

Prove that  $A = A' = A''$ .

5. Find the quotient and remainder when  $a$  is divided by  $b$ :
  - $a = 241; b = 17$ .
  - $a = -241; b = 17$ .
  - $a = 0; b = 17$ .
6. Do Problem B7 in Hungerford Section 1.1.
7. Do Problem B10 in Hungerford Section 1.1.
8. Do Problem B11 in Hungerford Section 1.1.