

**425A FALL 2020 PROBLEM SET #9**

**Problem 1.** Pugh (2nd edition) chapter 2 problem 59.

**Problem 2.** Pugh (2nd edition) chapter 2 problem 71.

**Problem 3.** Pugh (2nd edition) chapter 2 problem 85.

**Problem 4.** Pugh (2nd edition) chapter 2 problem 97.

**Problem 5.** Pugh (2nd edition) chapter 2 problem 98.

**Problem 6.** Pugh (2nd edition) chapter 2 problem 99(a,b,c)

**Problem 7.**

- (a) Prove that a real number lies in the Cantor set  $\mathcal{C}$  if and only if it has a ternary expansion (i.e. base 3) without any 1's.
- (b) Is every number in the Cantor set an endpoint of one of the intervals we removed? Is every number in the Cantor set rational?

**Problem 8.** Write out a reasonable and precise definition of the middle fifths Cantor set. Convince yourself (but you do not need to write it down) that it is a Cantor space (see page 112 for the definition).

**Problem 9** (Extra credit). Pugh (2nd edition) chapter 2 problem 68.

**Problem 10** (Extra credit). Pugh (2nd edition) chapter 3 problem 31.