

You are expected to solve homework problems individually. If needed, you may seek help from your friends. However, do not copy. Show all steps with your solutions for full credit.

**Name:** \_\_\_\_\_ **/ 50**

1. ( 10 points) Which gates are called "universal" gates? Why?
  
  
  
  
  
  
  
  
  
  
2. ( 20 points) Draw logic circuits AND, OR, and NOT using universal gate NAND.
  
  
  
  
  
  
  
  
  
  
3. (20 points) Draw logic circuits AND, OR, and NOT using universal gate NOR.