

Name: \_\_\_\_\_ .

### **Preview Chapter 6: Premium Calculation**

*Directions: Print out and complete, based on your reading of the text. If there are multiple sheets, staple together the top left corners (in the correct order). Turn in at the start of class on the date due. Do not submit answers on notebook paper or via email. No credit for late or incomplete preview assignments. Assignments may be turned in, in advance, to my mailbox in 233 MSB.*

#### **§6.8: The portfolio percentile premium principle**

1. When we say we have a portfolio of identical and independent policies,
  - (a) what do we mean by 'identical'?
  
  
  
  
  
  
  
  - (b) what do we mean by 'independent'?
  
2. Suppose we have a portfolio of  $N$  identical and independent policies. If  $L_{0,i}$  denotes the present value of future loss random variable for the  $i$ -th policy, and  $L$  denotes the present value of future loss random variable for the whole portfolio, find a formula for each of the following.
  - (a)  $L =$
  - (b)  $E[L] =$
  - (c)  $V[L] =$
  
3. How is the premium set in the portfolio percentile premium principle?
  
  
  
  
  
4. If  $N$  is sufficiently large, how is  $L$  distributed? What theorem tells us this?
  
  
  
  
  
5. Write the condition that the future loss of a portfolio is negative with probability  $\alpha$  in terms of  $\Phi$ , the cumulative distribution function of the standard normal distribution.
  
  
  
  
  
6. If  $P$  is the premium set according to the portfolio percentile premium principle, what does  $P$  approach as the number of policies,  $n$ , in the portfolio approaches infinity?