UNIVERSITY OF TEXAS AT AUSTIN

Quiz #10

Per loss. Per payment. Limited loss.

Provide your **complete solution** to the following problems. Final answers only, without appropriate justification, will receive zero points even if correct.

Problem 10.1. (2 pts) The ground-up loss random variable is denoted by X. An insurance policy on this loss has an ordinary deductible of d. Then, the expected **policyholder** payment per loss equals

$$\mathbb{E}[X \wedge d].$$

True or false? Why?

Problem 10.2. (6 points) *Source: Sample P exam, Problem #46.* A device that continuously measures and records seismic activity is placed in a remote region. The time T to failure of this device is exponentially distributed with mean 3 years. Since the device will not be monitored during its first two years of service, the time to discovery of its failure is $X = \max(T, 2)$. Calculate the expected time until discovery of failure.

Problem 10.3. (7 points) *Source: Sample P Exam, Problem #147.* The severity random variable covered by a car insurance company follows an exponential distribution. By imposing a deductible of d, the insurance company reduces the expected claim payment by 10%. In other words, the expected value of the per loss random variable is by 10% lower than the expected value of the severity. Calculate the percentage reduction on the variance of the claim payment.