

---

UNIVERSITY OF TEXAS AT AUSTINQuiz #14

Splicing. Franchise deductibles.

Please, provide your complete solutions to the following questions:

**Problem 14.1.** (8 points) A model for the arrival time  $T$  for a particular event is initially an exponential distribution with mean 2 years. Upon reconsideration, this distribution is replaced with a spliced model whose density function:

- (i) is proportional to the initial model's density function over  $[0, 1]$ ,
- (ii) is uniform over  $[1, 3]$ ,
- (iii) is continuous at 1,
- (iv) is zero on  $(3, \infty)$ .

Calculate the probability of failure in the first year under the revised distribution.

**Problem 14.2.** (2 points) The ground-up loss random variable is denoted by  $X$ . An insurance policy on this loss has a **franchise** deductible of  $d$  and no policy limit. Then, the expected **policyholder** payment per loss equals

$$\mathbb{E}[X\mathbb{I}_{[X < d]}].$$

*True or false?*

**Problem 14.3.** (5 pts) Let the loss random variable  $X$  be Pareto with  $\alpha = 3$  and  $\theta = 5000$ . There is a franchise deductible of  $d = 1000$ . What is the expected value of the per payment random variable?