

Quiz 13

ECEn 370

Name: _____ KEY _____

1. Consider a modification of the "run of heads" or St. Petersburg game. All rules are the same except the return payment is now $2i$ dollars if the first tail appears on the i^{th} coin toss (i.e. you get \$2 for each toss). What is the fair price to pay to play this game (use the standard probabilistic definition of a fair game)?

$$E[X] = \sum_{i=1}^{\infty} 2i \left(\frac{1}{2}\right)^i = 2 \left(\frac{1}{2}\right) \sum_{i=1}^{\infty} i \left(\frac{1}{2}\right)^{i-1} \frac{1}{(1-1/2)^2} = 4$$

A fair price is \$4.00.