Youngberg

Econ 280—Bethany College

**Homework 03**

Answer all the following on a ***typed, stapled*** (if applicable)separate sheet of paper. You do not need to type equations and graphs. I charge 25 cents to staple your homework. Make sure that you justify your answers, use your own words, and show your work. All questions are equally weighted.

1. Discuss a time when you faced Knightian uncertainty. Be sure to highlight how you knew it was Knightian uncertainty rather than risk.
2. Calculate the following expected values:
   1. You get $20 if an even number is rolled on a 20-sided die.
   2. You get $100 if a “20” is rolled on a 20-sided die.
   3. You get $100 if a “20 ***or*** a “1” is rolled on a 20-sided die.
   4. You get $1 equal to the value rolled on a 10-sided die (a “1” gets you $1, a “2” gets you $2, etc).
   5. You get $50 if a “20” is rolled on a 20-sided die ***and*** a “10” is rolled on a 10-sided die. (Both dice are rolled at the same time.)
3. In class we discussed how insurance companies rely on risk-averse individuals to make money and gambling establishments rely on risk-loving individuals to make money. Provide another example of a product which clearly relies on either risk-averse individuals or risk-loving individuals to make money. Be sure to justify your example (a mathematical hypothetical like we did in class would be helpful).
4. For each of the following errors, indicate if it is Type I or Type II error. ***Briefly***,justify your result.
   1. The CIA mistakes a school for a terrorist training camp, leading to a missile strike (and PR nightmare).
   2. Billy McDougal never considered economics for his major, a discipline he would have enjoyed a lot.
   3. The Department of Energy makes a $500,000,000 loan to Solyndra—a solar power company. Shortly thereafter the company goes bankrupt.
   4. ABC rejects the proposal for a new show called “The Sultan of Suede.” The show later becomes a big hit on another network.
   5. CEO Nwabudike Morgan doesn’t hire the brilliant scientist Prokhor Zakharov, mistakenly believing his head is too far in the clouds to do serious work.
5. In July of 2012, the FDA approved an at-home HIV test. According to the *New York Times*:[[1]](#footnote-1)

Researchers found the home test accurate 99.98 percent of the time for people who do not have the virus. By comparison, they found it to be accurate 92 percent of the time in detecting people who do [have the virus].

About one in 10,000 Americans have the virus, or Pr(HIV) = 0.0001. If you take this home test and the results are positive, what are the chances you have HIV? (HINT: Use Bayes Rule.)

1. <http://www.nytimes.com/2012/07/04/health/oraquick-at-home-hiv-test-wins-fda-approval.html> [↑](#footnote-ref-1)