

0.1 Economics 6818 Quiz 7

In class, groups of one -closed book

1. Let G represent gubers, where G is a random variable with

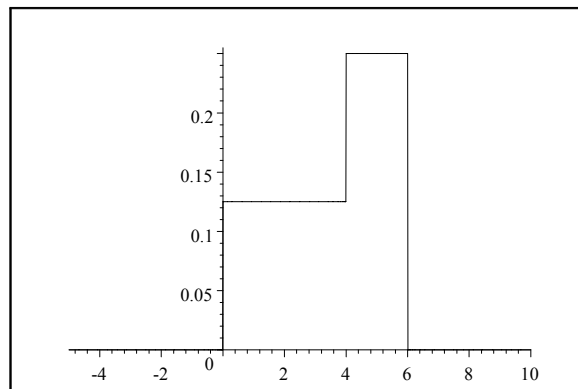
$$f_G(g) = \begin{cases} .125 & \text{if } 0 \leq g \leq 4 \\ .25 & \text{if } 4 < g \leq 6 \\ 0 & \text{otherwise} \end{cases}$$

Charlotte tells you that she has randomly sampled one G from this distribution, and its realized value is 7. How likely is it that she is either mistaken or lying? Jesse tells you that he has randomly sampled one G from this distribution, and its realized value is 5.6. How likely is it that 5.6 is a random draw from this distribution; that is, what is the probability of drawing a $g \geq 5.6$ if the true distribution is $f_G(g)$? Explain.

answer: The 7 could not have come from this population. The 5.6 could have. Picture $f_G(g)$

$$f(g) = \begin{cases} .125 & \text{if } 0 \leq g \leq 4 \\ .25 & \text{if } 4 < g \leq 6 \\ 0 & \text{if } 6 < g \\ 0 & \text{if } g < 0 \end{cases}$$

f



50% of the density is in the range $4 < g \leq 6$. Break this up into 5 equal ranges with 10% in each: $4 < g \leq 4.4$, $4.4 \leq g \leq 4.8$, $4.8 \leq g \leq 5.2$, $5.2 \leq g \leq 5.6$, and $5.6 \leq g \leq 6.0$. So there is a 10% chance of randomly drawing a $g \geq 5.6$ from $f_G(g)$. Said the other way, there is a 90% chance that the drawn g is between 0 and 5.6.

If one set her level of significance at .10 one would reject the null hypothesis that 5.6 is a random draw from $f_G(g)$. If one set her significance level at .05, one would not reject the null hypothesis.