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Econ 3070-002 Practice Problems for Exam 1

1. Recall Shirley Sixpack from problem 6 in HW 1, who only cares about the amount of beer she drinks, not the size of the cans the beer comes in. The price of a 8-oz can is \$4 and the price of a 16-oz can is \$6. Shirley has \$96 to spend on beer.
 - a) Draw her IC curves and budget line on the same diagram. Identify her optimal choice
 - b) Write down the equation for her optimal choice x_1^* and x_2^*
2. Re-do Problem 1 for Lorraine from HW1 problem 6b. She only drink 8 ounces of beer at a time and throws away the rest.
3. Math Practice:
 - a) Simplify $\ln(x^4y^2)$.
 - b) For the equation $4x+3y=24$, re-write the equation in terms of $y=$. Identify the y -intercept, the x -intercept, the slope, and graph the function.
 - c) Calculate the derivative and simplify: $u = 5x^3 - 3x + 4$
4.
 - a) For the utility function $U=X^2+Y^2$, calculate the marginal utilities and the MRS
 - b) Draw the Indifference Curves
 - b) How many units of X and Y would this consumer choose to consume? (i.e. generate equations for X and Y in terms of m , p_x and p_y).
5. A consumer has the utility function: $u(x_1, x_2) = \log(x_1) + x_2$.
Find the demand functions and the consumer's optimal choices in the following cases:
 - a. $p_1 = 1, p_2 = 1, \text{ and } m = 20$
 - b. $p_1 = 1, p_2 = 1, \text{ and } m = 10$
 - c. $p_1 = 2, p_2 = 1, \text{ and } m = 10$
6.
 - a) $m=100, p_1=10, p_2=5$. Draw the budget line.
 - b) There is a tax of \$ 5 on good 2 consumption above 10 units. Draw the new budget line.