Econ 310 Week 7 Homework
Due: Tuesday 10/15

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1. A consumer with income $I = 200$ has a utility function over two goods, x and y:

$$u(x, y) = x^{1/4} y^{3/4}$$

The price of good x is $p_x = 5$ and the price of good y is $p_y = 5$.

   a. Write down the constrained optimization problem.

   b. Solve for the optimal consumption bundle of x and y.

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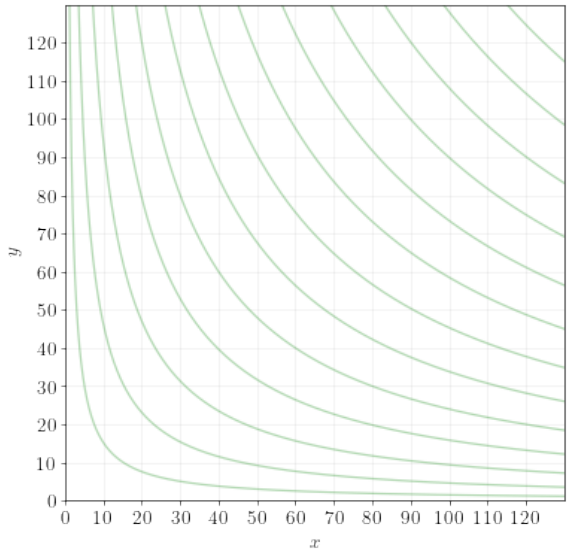
2. A consumer with income $I = 1200$ has a utility function over two goods, x and y, represented by the indifference curves below.



The price of good x is $p_x = 10$ and the price of good y is $p_y = 15$.

   a. Draw the budget constraint on the diagram above.

   b. What is the optimal choice of x and y?

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3. A consumer with income $I = 420$ has a utility function over two goods, x and y:

$$u(x, y) = x + 10y^{1/2}$$

The price of good x is $p_x = 7$ and the price of good y is $p_y = 7$.

Solve for the optimal consumption bundle of x and y.

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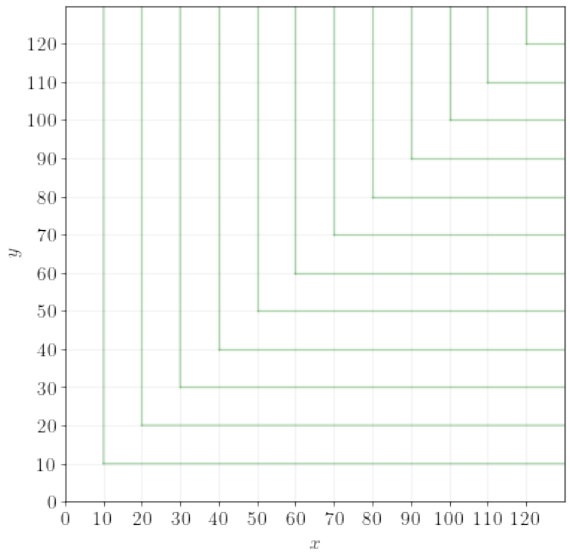
4. A consumer with income $I = 480$ has a utility function over two goods, x and y, represented by the indifference curves below.



The price of good x is $p_x = 16$ and the price of good y is $p_y = 8$.

a. Draw the budget constraint on the diagram above.

b. What is the optimal choice of x and y?

c. What type of utility function does this consumer have?

d. Are x and y complements are substitutes?

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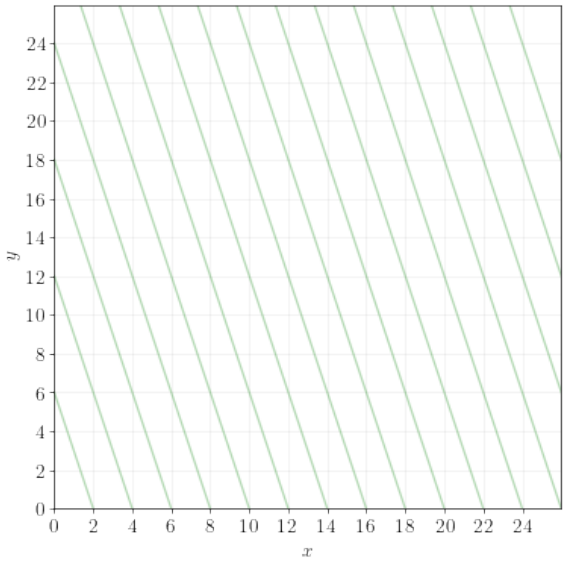
5. A consumer with income $I = 24$ has a utility function over two goods, x and y, represented by the indifference curves below.



The price of good x is $p_x = 2$ and the price of good y is $p_y = 2$.

a. Draw the budget constraint on the diagram above.

b. What is the optimal choice of x and y?

c. Are x and y complements or substitutes?

d. Re-do the problem with $p_x = 12$.

e. Re-do the problem with $p_x = 6$.
