harmonic.

A consumer has utility function:

$$U(x) = \frac{2}{\frac{1}{x_1} + \frac{1}{x_2}}$$

part 1.

a) Does this consumer have homothetic preferences? *Justify your answer.*

b) Find the Marshallian demands for this consumer.

c) Say something interesting in *less than 100 words* about how this consumer's behavior compares to one with $U(x) = x_1 x_2$.

bonus*) Say something interesting in *6 words* about how this consumer's behavior compares to one with $U(x) = x_1 x_2$.

part 2.

a) Find the expenditure function for the consumer.

b) Find the Hicksian demand for the consumer using *Shephard's Lemma.*

c) Find the income and substitution effect for a change in p_1 on x_1 in terms of p_1, p_2, m.

northweferences.

Kim and Kanye both have complete, transitive, convex preferences on the convex feasible set X. North, *their child*, prefers bundle x to y if and only if both Kanye and Kim do. That is:

$$x \succsim_{North} y \iff x \succsim_{Kanye} y \text{ and } x \succsim_{Kim} y$$

a) Is $\succsim_{North}$ necessarily transitive? *Justify your answer.*

b) Is $\succsim_{North}$ necessarily convex? *Justify your answer.*

c) $\succsim_{North}$ is complete, what can you infer about $\succsim_{Kanye}$ and $\succsim_{Kim}$.

*Bonus awarded in glory, not points.

quasience.

A consumer has utility function:

$$U(x) = (x_1)^{\frac{1}{2}} (x_2)^{\frac{1}{2}} + ln(x_3)$$

She decides to budget her income m such that:

$$m = m_{1,2} + m_3$$
$$m_{1,2} \geq p_1 x_1 + p_2 x_2.$$
$$m_3 \geq p_3 x_3$$

a) Find the optimal x_1 and x_2 as functions of $p_{1,}p_2, m_{1,2}$.

b) Write down a quasi-value function $\tilde{V}(p_1, p_2, p_3, m, m_{1,2})$.
i.e. write down the consumers maximized utility level conditional only on the parameters p_1, p_2, p_3, m and her choice of $m_{1,2}$.

c) Prove that this quasi-value function is quasi-concave in $m_{1,2}$.

d) Find the optimal $m_{1,2}$ and m_3.

e) Write down the Mashallian demands for x_1, x_2, x_3.

f) Why is this consumer able to optimize x_1 and x_2 given $m_{1,2}$without concern for the level of x_3?