Question 1 (30 points)

Let the utility function be:

\[ u(x_1, x_2) = \sqrt{x_1} + x_2 \]

1. Determine the demanded bundle as a function of the prices, \( p_1 \) and \( p_2 \) and the income, \( m \).

2. Extra Points Draw the demand for good \( x_1 \) as a function of its price \( p_1 \).

Question 2 (30 points)

Consider the preference relation on \( X = \mathbb{R}^2_+ \) defined as follows: for any element \( x = \left( \begin{array}{c} x_1 \\ x_2 \end{array} \right) \) and \( y = \left( \begin{array}{c} y_1 \\ y_2 \end{array} \right) \) of \( X \):

\[ x \succeq y \text{ if and only if } \max\{x_1, x_2\} \geq \max\{y_1, y_2\} \]

1. Is this preference relationship complete?

2. Is it transitive?

3. Extra Points Are these preferences strongly monotonic? that is, is it true that \( x_1 \geq y_1 \) and \( x_2 \geq y_2 \), with at least one inequality strict, implies that \( x \succ y \)?