

QUIZZ 1, PUBLIC GOODS

Part 1. What are the two characteristics of a public good?

A public good is non excludable and non rival

Part 2. How do we aggregate demands, when we are talking about private goods?

Horizontal Sum, we add quantities not prices

Part 3. How do we aggregate demands when we have a public good?

Vertical sum, adding each MRS

Part 4. Consider 3 individuals, indexed by i , they have the following utility function $U_i = 4x^{1/2} + iM$, Find the market demand if we consider x as a private good. Assume price of is P_x and $P_m = 1$, and the wealth is such that there is interior solution.

Since for each guy the $MRS_i = \frac{2x^{-1/2}}{i}$

Thus the condition for finding demands is $MRS_i = \frac{P_x}{i}$, thus $2\frac{x}{i}^{-1/2} = \frac{P_x}{1}$, So $x_i^* = \left(\frac{iP_x}{2}\right)^{-2} = \frac{4}{i^2P_x^2}$

Now we have three guys Thus , $X^{market} = \frac{4}{P_x^2} + \frac{1}{P_x^2} + \frac{4}{9P_x^2} = \frac{7}{P_x^2}$

Part 5. Find the social demand if x is now a public good.

Now you add each MRS , so $\frac{12x^{-1/2}}{6} + \frac{6x^{-1/2}}{6} + \frac{4x^{-1/2}}{6} = \frac{11x^{-1/2}}{3}$, and make it equal to the price relationship.

$$\frac{11x^{-1/2}}{3} = p_x, X^* = \frac{121}{9P_x^2}$$