

ECOMATH V24 Group Quiz 03

Name _____

ID Number _____

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1. (4 points) On an xy -plane, sketch the region defined by the constraints $0 \leq x \leq 5$, $0 \leq y \leq 3$, and $-x + 2y \leq 2$. In other words, shade the region for which all pairs (x, y) will satisfy ALL constraints. You may want to try some test points to help you find the appropriate region.

2. Each of two firms A and B produces its own brand of mineral water in amounts denoted by x and y , which are sold at prices p and q per unit, respectively. Each firm determines its own price and produces exactly as much as is demanded. The demands for the two brands are given by $x = 29 - 5p + 4q$ and $y = 16 + 4p - 6q$. Firm A has total costs $5 + x$ and Firm B has total costs $3 + 2y$. Suppose these two firms decide to join forces and act as one monopolist.

(a) (1 point) Write down the profit function specific to the situation as a function of both p and q .

(b) (3 points) Find the stationary points of the profit function.

(c) (2 points) Classify these stationary points as local maxima, local minima, or saddle points.