SF 2972 GAME THEORY
Problem set 1 A

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1. Consider the two-player normal-form game

	L	M	R
A	$8, 11$	$-3, 0$	$0, 0$
B	$9, -1$	$4, 1$	$0, 0$
C	$0, -2$	$0, 0$	$1, 4$

   (a) Find all *rationalizable* pure strategies in G.

   (b) Find all Nash equilibria (in pure and mixed strategies).

   (c) Find all (normal-form) *perfect equilibria* (in pure and mixed strategies).

   (d) Find all *proper equilibria* (in pure or mixed strategies).

2. Individual 1 has to choose an effort level $x_1 \in [0, 1]$, and individual 2 an effort level $x_2 \in [0, 1]$, resulting in provision $x_1 + x_2$ of a public good (say, a clean shared kitchen), and in utilities

$$u_1(x) = (x_1 + x_2)\sqrt{1 - x_1}$$
$$u_2(x) = (x_1 + x_2)\sqrt{1 - x_2}$$

   (a) Suppose x_1 and x_2 have to be selected simultaneously. Specify the associated normal-form (pure-strategy) game $G = (N, S, u)$. Find each player's best-reply correspondence, find the set of pure-strategy Nash equilibria, and illustrate your results in a diagram with x_1 on the horizontal axis and x_2 on the vertical axis.

   (b) Suppose individual 1 has to select x_1 before individual 2 selects x_2, and assume that individual 2 observes x_1 without error, before 2 selects x_2. Specify the associated normal-form game $G' = (N, Z, v)$ in pure strategies.