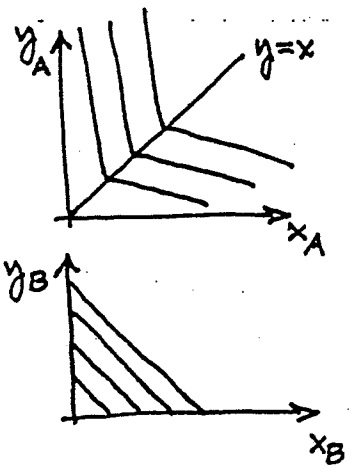
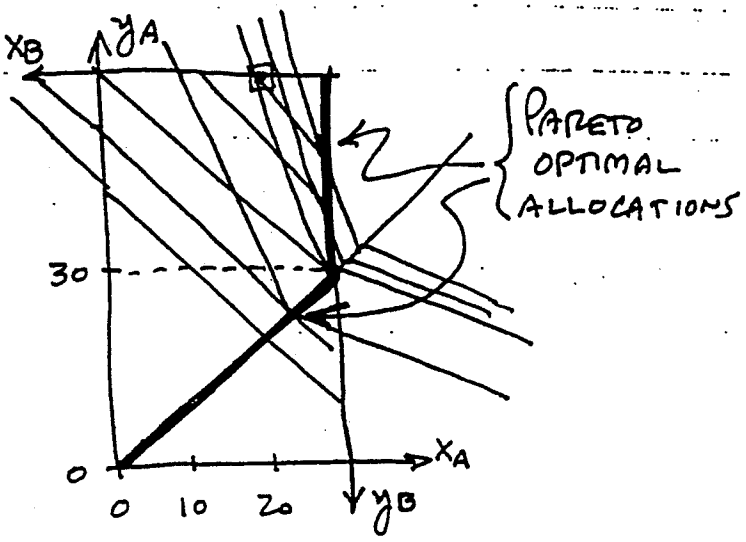
Spring 1990 Eco 501 Mid-Term Exam

Solutions

#3

#3 (1) (a)





(b) It is clear in the diagram above that $\frac{P_x}{P_y} = 3$ is the only competitive price ratio p: If $p > 3$, then A and B would both demand $x = 0$; if $p < 3$, then demands are $x_A > 30$ (∴ excess demand for x) and $y_A < 60$, $y_B = 0$ (∴ excess supply of y). At $p = 3$: ~~$x_B = 0$, $y_B = 10p = 30$~~; and A can do no better than at $x_A = 30$, $y_A = 30$ (same utility level as at A's endowment).

(2) (a) $((8,8),(4,4),(8,8)) \in$ Core: The 3-person coalition cannot improve (each MRS = 1, ∴ Pareto optimal). No 1-person coalition can improve (each u^i is as large as at i's endowment). {A, C} cannot improve ($MRS^A = MRS^C$ and the endowment bundle owned by {A, C} is being allocated to them). {A, B} owns the bundle (16, 8), with which they can do no better than $u^A(11, 5\frac{1}{2}) = 60\frac{1}{2} < 64$ and $u^B(5, 2\frac{1}{2}) = 12\frac{1}{2} < 16$. Similarly for {B, C}.

(b) $((9,9),(4,4),(7,7)) \notin$ Core: {B, C} owns (8, 16) and $u^B(3.6) = 18 > 16$ and $u^C(5.10) = 50 > 49$.