Problem Set 2 -- Suggested Answers, Correction on #6

The original suggested equation of the production frontier has mistaken exponents. The mistaken equation is "$R^2+c^2 = 168^2$"

6. Starr's General Equilibrium Theory, problem 4.3 (same in both editions).
Corrected Suggested Answer: **Starr 4.3.** (i) Let the production frontier in (R, c) – space be described by $R^{(1/2)}+c^{(1/2)} = 168$, equivalently $\sqrt{R} + \sqrt{c} = 168$, and let Robinson's utility function be U(R, c) = 2c+R. Then there is a competitive equilibrium allocation at a corner solution where all consumption takes the form of oysters, with no leisure; that support the equililbrium can be w=1. This is a bit of a cheat, since the firm needs to recognize the quantity constraint on L.
(ii) Yes. 1FTWE does not require convexity.
(iii) Any linear price system with this nonconvex production frontier will lead to production at a corner solution. Strongly convex demand behavior can drive demand to an interior solution (e.g. u(R,c) = min[R,c]. Hence there may be no competitive equilibrium.
(iv) Same answer as (iii). Pareto efficient allocation may be at an interior solution that cannot be sustained as a competitive equilibrium with non-convex production technology. Competitive production plans are corner solutions. A Pareto efficient allocation cannot *generally* be sustained as a competitive equilibrium in a nonconvex economy.