Information Economics, Fall 2015
Pre-lecture Problems for Lecture 4

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Note. The deadline of submitting the pre-lecture problem is ***9:20am, October 12, 2015***. Please submit a hard copy of your work to the instructor in class. Late submissions will not be accepted. Each student must submit her/his individual work. Submit ONLY the problem that counts for grades.

1. (0 points) Recall that the manufacturer's expected profit is

$$Q(w-c)-\int_0^{(1-R)Q} RQrf(x)dx-\int_{(1-R)Q}^{Q}(Q-x)rf(x)dx$$

   as derived in page 22 of the slides. Differentiate this function with respect to r and R, respectively.

2. (0 points) Consider a retailer under a full-return contract with a return credit $0<r\leq 1$, where the wholesale price is 1.

   (a) Find the optimal order quantity q^* when the random demand follows a uniform distribution between 0 and 1, the unit production cost is 0, and the unit retail price is 2.

   (b) Find the coordinating return credit r^*.

3. (10 points) Consider a retailer under a full-return contract with a return credit $0<r\leq w$, where w is the wholesale price.

   (a) (3 points) Find the optimal order quantity q^* when the random demand follows a uniform distribution between 0 and 1, the unit production cost is c, and the unit retail price is p.

   (b) (4 points) How do c, p, w, and r affects q^*? Intuitively explain why.

   (c) (3 points) Find the coordinating return credit r.