Department of Economics, University of California, Davis
Ecn 200C – Micro Theory – Professor Giacomo Bonanno

ANSWERS TO PRACTICE PROBLEMS 17

1.

First we have to check, for each type of consumer which package the consumer would choose.

	willingness to pay for 50 units (package 1)	cost of package 1	surplus from package 1	willingness to pay for 40 units (package 2)	cost of package 2	surplus from package 2
Type 1	area under demand curve from 0 to 50 $\frac{100(50)}{2} = 2500$	2,500	0	area under demand curve from 0 to 40 = 2,400	2,200	**200**
Type 2	area under demand curve from 0 to 50 (note when Q = 50, P = 30): $\frac{(80-30)50}{2} + 30(50)$ = 2,750	2,500	**250**	area under demand curve from 0 to 40 = 2,400	2,200	200

Thus type 1 consumers choose package 2 and type 2 consumers choose package 1.

The profit (gross of fixed cost) from a type 1 consumer (i.e. from a package 2) is:
$2{,}200 - 10(40) = 1{,}800$.

The profit (gross of fixed cost) from a type 2 consumer (i.e. from a package 1) is:
$2{,}500 - 10(50) = 2{,}000$.

Thus total profits are: 100 (1,800) + 50 (2,000) – 200 (fixed cost) = \$279,800.

2.

POLICY 1: When P = 17, a type 1 consumer buys 8 units and a type 2 consumer buys 8 units. Thus the firm's profits are: $n[(17)(8)-8] + n[(17)(8)-8] = \mathbf{256}n$

POLICY 2: When P = 13, a type 1 consumers buys 10 units and a type 2 consumer buys 12 units. Thus the firm's profits are: $n[(13)(10)-10] + n[(13)(12)-12] = \mathbf{264}n$

POLICY 3. For each consumer, the willingness to pay for 12 units is given by the area under the demand curve between 0 and 12 and the willingness to pay for 8 units is given by the area under the demand curve between 0 and 8. Thus

	willingness to pay for 12 units (package 1)	willingness to pay for 8 units (package 2)	cost of package 1	cost of package 2	surplus from package 1	surplus from package 2
TYPE 1	252	200	220	136	32	**64**
TYPE 2	228	168	220	136	8	**32**

Thus both types end up choosing package 2. It follows that the firm's profits are: $2n(136-8) = \mathbf{256}\boldsymbol{n}$.

POLICY 4. For each consumer, the willingness to pay for 16 units is given by the area under the demand curve between 0 and 16 and the willingness to pay for 12 units is given by the area under the demand curve between 0 and 12. Thus

	willingness to pay for 16 units (package 1)	willingness to pay for 12 units (package 2)	cost of package 1	cost of package 2	surplus from package 1	surplus from package 2
TYPE 1	272	252	264	243	8	**9**
TYPE 2	272	228	264	243	**8**	–15

Thus type 1 consumers choose package 2 and type 2 consumers choose package 1. It follows that the firm's profits are: $n(243-12) + n\,(264-16) = \mathbf{479}\boldsymbol{n}$.

Clearly, the best policy for the firm is policy 4.