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Week 6 Check your understanding
Check Your Understanding

2. Ajax Cleaning Products versus Tile King.

a. MC = d(TC)/dQ = −5000 + 200 Q

b. P = MR = $20,000

4. Unique Creations holds a monopoly in magnometers.

a. MC = dTC/dQ = 20

c. MR = 60(1 + 1/−1.5) = $20

6. Wyandotte Chemical Company sales 30,000 gallons of polyol at $15/gallon.

a. ED = %ΔQD / %ΔP, –2.0 = +15% / %ΔP.   To get 15% more sales, it can %ΔP = –7.5%.   Using the arc price formula, we can get the new price and new quantity:
–.075 = (P2 – 15.00)/ [(P2 + 15)/2]
P2 = $13.92
ΔP = $15 –$13.92 = $1.08
Also:   .15 = (Q2 – 30,000)/ [(Q2 + 30,000)/2]
Q2 = 34,865 gallons

b. i).   On TR: Before: TR, = 15(30,000) = $450,000
After: TR2 = 13.92(34,865) = $485,321, so ΔTR = +$35,321

ii). On TC: Before: FC1 =$90,000
After: FC2 = $90,000
VC/unit = $6.00 – .60 = $5.40
VC2 = $5.40 × 34,865 = $188,271
TC2 = 90,000 + 188,271 = $278,271, so ΔTC = +$8,271

iii). On Total Profits: Before: π, = $450,000 – $270,000 = $180,000
After: π2 = $485,321 – $278,271 = $207,050, or Δπ = + 27,050
Check: ΔTR

- ΔTC = Δπ:   $35,321 - $8,271 = + 27,050.

o Chapter 12: Problems 1, 2(b), and 5(b)

1.   Cournot duopoly problem for firms C and D with different TC curves.

a. πC = PQC − TCC   = (600 − QC − QD)QC − (25,000 + 100QC)
= −25,000 + 500QC − QC2 − QCQD
πD = (600 − QC − QD) QD − (20,000 + 125QD) = −20,000 + 475QD − QD2   − QCQD

∂πC/∂QC = 500 − 2QC − QD       and     ∂πD/∂QD = 475 − 2QD − QC

Conditions for an optimum require that both partials be set equal to zero and the resulting equations be solved simultaneously for optimal values of QC and QD:

QD\* = 150 units and QC\* = 175 units.   P = 600 – 150 – 175 = $275, so P\* = $275.

b. πC\* = −25,000 + 500(175) − (175)2 − 175(150) = $5,625.
πD\* = −20,000 + 475(150) − (150)2 − 175(150) = $2,500.

2b.
b. πA\* = −1500 + 145(30) − 2(30)2 − 30(25) = $300.
πB\* = −1200 +180(25) − 3(25)2 −30(25)= $675.
Also   π\* = 300 + 675 = $975.

5. Alchem is a dominant firm price leader in polyglue.

a.     Alchem's (L) profit-maximizing output occurs where: MRL = MCL
            MRL is found as follows:   MRL = d(TRL)/dQL

To be continue …………………..