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CECT 4140

Exerciice 2.12

CF = $4200, p = 150 – 0.02D

 vc = $53/board

1. Revenue = p\*D = (150 – 0.02D)D

Revenue = 150D – 0.02D2

d(Revenue)/dD = 0

150 – 0.4D = 0 then D = 3750 boards

1. Profit = Revenue – CT

Profit = (150 – 0.02\*3750)3750 –(42000 + 53\*3750)

Profit = $40500

1. Breakeven : Revenue =CT

p\*D = 42000 + 53\*D

(150 – 0.02D)D = 42000 + 53D

150D – 0.02D2 = 42000 + 53D

150D – 0.02D2 = 42000 + 53D

0.02D2 -97D + 42000 = 0

D1 = 480.617 and D2 = 4369.3829

1. The company range of profitable demand is between the twobreakevenpointsD1 and D2

Exercice 2.13

VC = vc\*D

p = 180-5D

Vc = 40 then VC =40D

Revenue = p\*D then Revenue = (180-5D)D

Revenue = 180D – 5D2

d(Revenue)/dD =180-10D

180-2D = 0 then D = 18

Profit = Revenue – CT

Profit = (180-5\*18)18

Profit =$ 900

Exercice 2.14

CF = $900000 p = 600-0.05D

VC = $131.5/1000 boards

a)Revenue = p\*D = (600-0.05D)D

Revenue = 600D-0.05D2

d(Revenue)/dD = 600-0.1D

d(Revenue)/dD = 0 then 600 – 0.1D = 0

0.1D = 600 then D = 6000 units

b) Profit = Revenue – CT

CT = CF + CV = 900000 + 131.5\*(6000/1000)

CT = $900789

Revenue = (600 – 0.05\*6000)6000 = $1800000

Profit = 1800000-900789, Profit = $899211

Exercice 2.15

CT = 1000 + 40D, cv = $40

p = 38 + 2700/D – 5000/D2 for D > 1

a)Profit = Revenue – CT

Profit = (38 + 2700/D – 5000/D2 )D – (1000 + 40D)

 = 38D + 2700 – 5000/D – 1000 – 40D

 = 1700 – 2D – 5000/D

d(Profit)/dD = -2 + 5000/D2

d(Profit)/dD = 0, -2 + 5000/D2 = 0

then 2 = 5000/D2; 2D2 = 5000

D = 50

b) Profit = 1700 -2D – 5000/D(from a) )

Profit = 1700 - 2\*50 – 5000/50

Profit = $1500

To prove the D = 50 is the maximum, let

vary D over and under 50 and replace it in the

equation of the profit.

For D = 49, Profit = $1499.959

For D = 51 , Profit = $1499.96

By continuing to vary D in both direction, the value of the Profit will continue to decrease.

Exercice 2.16

Y = 12 + 0.3X + 0.27X2 = CT

Revenue = 15X - 0.2X2

Profit = Revenue – CT

 = (15X – 0.2X2) – (12 + 0.3X + 0.27X2)

 = 15X - 0.2X2 – 12 – 0.3X – 0.27X2

 = -0.47X2 +14.7X – 12

d(Profit)/dD = 0

 - 0.94X + 14.7 = 0 then X = 15.6383 megawatts

Excercice 2.17

FC = $100000, VC = $140000

Sale = $280000/ year

P = $40

D’ = CF(p – cv)

VC = cv\*D then cv = VC/D

D = $280000/40 = 7000 units/year

cv = VC/D = 140000/7000 = 20

then D’ = 100000/(40-20)

D’ =5000 units

Exercice 2.11

 

b) Fixed costs that airline should try to lower in order to decrease the breakeven point: salaries, employees’ benefits

Let’s make the fixed costs tend to zero. In this case the origin of the curve TC(total cost) will be at the point (0.0). The intersection of CT and TR which is the breakeven point will be minimum.

c) Reducing the variable cost (VC), let’s say tend to zero, the only costs that remain are the fixed cost. The breakeven point in this case the intersection of TR and VC. That would be the lowest point it could reach.