

SOLUTIONS
 ASSIGNMENT #5
 201-914-DW 03

p. 127

18 $R(x) = 89x$
 $C(x) = 1400 + 75x$

BREAK EVEN WHEN Revenue = COST

$$89x = 1400 + 75x$$

$$14x = 1400$$

$$x = 100$$

You must sell 100 recaps to break even.

20 (a) $R(x) = 50x$
 $C(x) = 30x + 10000$

(b) $R(x) = C(x)$
 $50x = 30x + 10000$
 $20x = 10000$
 $x = 500$

26 (a) $R(x) = 50x$

(b) The cost function is linear & we have 2 points of this cost function:
 (250, 7060) & (100, 4360)

$$m = \frac{7060 - 4360}{250 - 100} = \frac{2700}{150} = 18$$

so $C(x) = 18x + b$ sub. in (100, 4360)

$$4360 = 18(100) + b$$

$$b = 2560$$

so $C(x) = 18x + 2560$

#34 $p + 2q = 100$
 $35p - 20q = 350$

when price is $p = 14$

Supply:

$$35(14) - 20q = 350$$

$$-20q = 350 - 490$$

$$q = 7$$

demand:

$$14 + 2q = 100$$

$$2q = 86$$

$$q = 43$$

There is MORE demand than supply,
 so there are NOT enough phones
 to meet demand

#36

Two points on the linear demand
 function are $(2500, 1)$ & $(3500, 0.9)$

$$m = \frac{0.9 - 1}{3500 - 2500} = \frac{-0.1}{1000} = -0.0001$$

so $p = -0.0001q + b$

sub in $(2500, 1)$

$$1 = -0.0001(2500) + b$$

$$b = 1.25$$

$$p = -0.0001q + 1.25$$

38 Supply FUNCTION is linear & 2 points on the line are (100000, 30) & (80000, 25)

$$m = \frac{30 - 25}{100000 - 80000} = \frac{5}{20000} = 0.00025$$

so $p = 0.00025q + b$
sub in (100000, 30)

$$30 = 0.00025(100000) + b$$

$$b = 30 - 25$$

$$b = 5$$

$$p = 0.00025q + 5$$

44

$$p = -2q + 320$$

$$p = 8q + 2$$

$$-2q + 320 = 8q + 2$$

$$318 = 10q$$

$$q = \frac{159}{5} \text{ or } 31.8$$

$$p = 8q + 2$$

$$= 8(31.8) + 2$$

$$= 256.4$$

OR

$$p = 8\left(\frac{159}{5}\right) + 2$$

$$5p = 1272 + 10$$

$$p = \frac{1282}{5}$$

Market equilibrium

$$(31.8, 256.4) \text{ OR } \left(\frac{159}{5}, \frac{1282}{5}\right)$$

50

demand: $(10, 75)$ & $(30, 25)$

Supply: $(35, 80)$ & $(5, 20)$

$$\text{demand: } m = \frac{75-25}{10-30} = \frac{50}{-20} = -\frac{5}{2}$$

$$p = -\frac{5}{2}q + b$$

$$75 = -\frac{5}{2}(10) + b$$

$$75 + \frac{50}{2} = b$$

$$p = -\frac{5}{2}q + 100$$

$$\text{supply: } m = \frac{80-20}{35-5} = 2$$

$$p = 2q + b$$

$$20 = 2(5) + b$$

$$b = 10$$

$$p = 2q + 10$$

$$\text{Equilibrium: } -\frac{5}{2}q + 100 = 2q + 10$$

$$90 = \frac{9}{2}q$$

$$q = 20$$

$$\begin{aligned} p &= 2q + 10 \\ &= 2(20) + 10 \\ &= 50 \end{aligned}$$

MARKET equilibrium is $(20, 50)$

56

demand: $p = -8q + 2800$

Supply: $p = 3q + 35$

AFTER TAX Supply: $p = 3q + 50$

MARKET EQU. $-8q + 2800 = 3q + 50$

$2750 = 11q$

$q = 250$

$p = 3(250) + 50$
 $= 800$

AFTER TAX ME : $(250, 800)$

