

Name:
 Section 1.4
 Math 151

Note: for solutions to odd numbered problems - see the text.

Section 1.4 – 1, 6, 7, 8, 11 – 14, 18, 26, 32, 36, 38, 40, 42

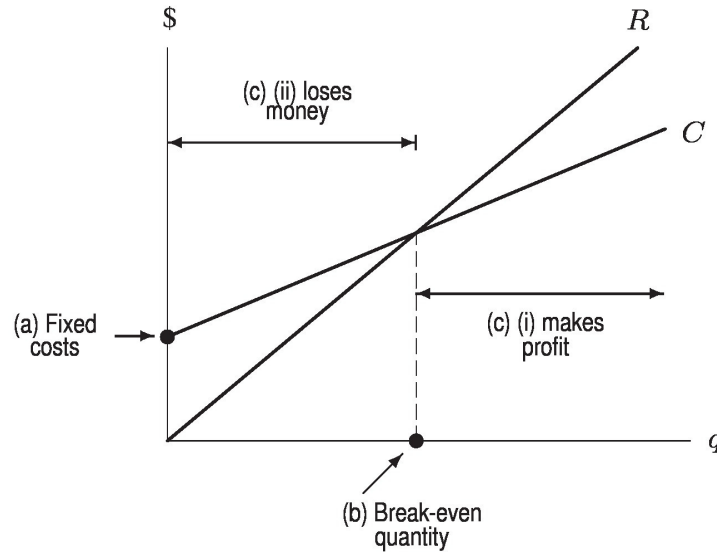


Figure 1.21

1

6. (a) A consulting company (think about why) (b) A software company

7. a). The statement $f(12) = 60$ says that when $p = 12$, we have $q = 60$. When the price is \$12, we expect to sell 60 units.

b). Decreasing, because as price increases, we expect less to be sold.

8. a). The cost of producing 500 units is

$$C(500) = 6000 + 10(500) = 6000 + 5000 = \$11,000.$$

The revenue the company makes by selling 500 units is

$$R(500) = 12(500) = \$6000.$$

Thus, the cost of making 500 units is greater than the money the company will make by selling the 500 units, so the company does not make a profit. The cost of producing 5000 units is

$$C(5000) = 6000 + 10(5000) = 6000 + 50000 = \$56,000.$$

The revenue the company makes by selling 5000 units is

$$R(5000) = 12(5000) = \$60,000.$$

Thus, the cost of making 5000 units is less than the money the company will make by selling the 5000 units, so the company does make a profit.

- b). The break-even point is the number of units that the company has to produce so that in selling those units, it makes as much as it spent on producing them. That is, we are looking for q such that

$$C(q) = R(q)$$

Solving for q gives $q = 3000$.

11. $C(q) = 500 + 6q$

12. $\pi(q) = 5q - 35,000$

13. $\pi(q) = 54q - 5000$

14. $\pi(q) = 0.05q$.

18. a). $C(0) = 4000 + 2(0) = \$4000$

b). \$2 is the marginal cost

c). $p = \$10$.

d). Break even point is 500.

26. a). Since cost is less than revenue for quantities in the table between 20 and 60 units, production appears to be profitable between those values.

b). Maximum profit is obtained when the production level is about 40 units.

32. a). The quantity demanded at a price of \$100 is 70,000 units. The quantity supplied is 100,000 units so some goods will remain unsold, therefore the price goes down.

b). Equilibrium price and quantity are \$80 and 80,000 units.

36. $80b + 20s = 2000$, where b is the number of books bought and s is the number of social outings. Sketch the graph as we did in class for the taxi company.

40. The new demand equation is $q = 100 - 5(p + 2) = 90 - 5p$. Notice that in this case the consumer pays $p + 2$ dollars per unit.

42. Before $p = \$190$ and $q = 70$ units and after \$194 and $q = 68$ units.