Solution *to Quiz #1 Section: 3(b)*

Name: *ID:*   *Serial:*

Q1.A person wishes to invest $32,000 in two projects **A** and **B**, so that the total income per year will be at least $2000. Project **A** pays 6% annually; and project **B** is more risky and pays 7% annually. What is the minimum amount that he should invest in project **B**?

Solution:

Let x = The amount that he should invest in project B. Then his total income per year will be at least $1500 iff:

$$(7/100)\,x + (6/100)(32000\text{-}x) \geq 2000$$

iff

$$(7/100)x - (6/100)x + 1920 \geq 2000$$

iff

$$(1/100)x \geq 2000\text{-}1920 = 80$$

iff

$$x \geq (100)(180) = 8000$$

Then minimum amount that he should invest in project B is $8000.

Q2. Suppose that the consumer will buy 150 units of a product if the price is $20 per unit and he will buy 120 units if the price is $30 per unit. Then find:
  a. The demand function assuming that it is linear.
  b. The quantity that the consumer will buy if the price is $25 per unit?

Solution:

(a) $m = (30-20)/(120-150) = -1/3$

Then the demand function is given by:

$$p - 30 = (-1/3)(q - 120)$$

which implies that

$$p = (-1/3)q + 70$$

(b) $p = 25 = (-1/3)q + 70$

implies that $q = (-3)(25-70) = 135$