

CANARSIE HIGH SCHOOL

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SEQUENTIAL MATHEMATICS

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APPLYING LINEAR EQUATIONS TO BUSINESS PROBLEMS :

WHAT IS "BREAK-EVEN POINT" (BEP) ?

A. DO NOW

Bob sells baseball caps \$6 per unit (selling price). They cost him \$4 per unit. Let x be the number of caps he will sell tomorrow. Write:

- (1) Bob's tomorrow revenue in terms of x .
- (2) The cost of x caps.
- (3) The profit in terms of x .
- (4) How many caps should he sell in order to make \$24 profit?

B. PROBLEM

Dshawn buys used tires wholesale \$15 per unit. He resells them \$25 per unit. The rent for the small warehouse where he keeps them is \$ 250.

I. Let x represents the number of tires Dshawn will sell this month. Write:

- (5) The month's revenue in terms of x .
- (6) The total cost of the month in terms of x .
- (7) the equation where revenue = total cost (no profit, no loss)

II. Solve the equation for x . The solution has a name in business : break-even point or the number of units sold to break even : no profit, no loss.

Using (5) and (6) to solve the following questions :

(8) write the month's profit in terms of x .

(9) write an equation where profit = 150.

(10) How many tires should Dshawn sell in order to make that profit?

C. HOMEWORK

Page 186 : Study Example 5 (Telephone problem).

Page 187: # 16, 17, 18.

Page 199 : # 7, 8, 17.

LESSON PLAN

Do Now (handout)

1. Define and discuss new terms : revenue, cost, profit, and loss.

2. Elicit the concept of fixed cost (rent in the used tires problem) : cost incurred whether units are sold or not.

Another example : utilities cost (left out in this problem.)

3. Elicit the concept of variable cost : it is dependent on the number of units bought.

4. Elicit the concept of total cost : fixed cost + variable cost

5. Cap Problem : Elicit profit in terms of x

: Profit = Revenue - Total Cost : $6x - 4x = 2x$

Development

- Find Break-Even Point by trial and error (guess and check to reach profit = 0)

x	Revenue = 25x	Total Cost = 15x+250	Loss or Profit
10	250	400	-150
....
20	500	550	- 50
30	750	700	+ 50
25 (BEP)	625	625	0

Find Break -Even Point algebraically

BEP is the number x of tires for which Profit = Total Cost , that is :

$$25x = 15x + 250$$

Solution : $x = 25$

Medial Summary

(What is break-even point ?)

Advanced question

Solve question (c) for more insight (later BEP will be visualized after coordinates and graphing concepts are introduced and discussed).