

# Algebra I

## Break Even Analysis for Small Business

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Hour: \_\_\_\_\_

- 1) Jesse wants to start a business making and selling skateboards. She will charge \$75 for each one. Her cost will be \$30 per skateboard for materials. She must pay \$500 per month rent (which includes utilities) so that she has a place to make and sell the skateboards.
- a) Write a rule for her revenue (money coming in).  
a) \_\_\_\_\_
- b) Write a rule for her cost.  
b) \_\_\_\_\_
- c) Write a rule for her profit (revenue - cost).  
c) \_\_\_\_\_
- d) If she sells 6 skateboards in one month, write how much the following will be:
- i. Revenue
  - ii. Cost
  - iii. Profit
- e) How many skateboards will she have to sell in order to break even (revenue = cost)? Explain how you got your solution.

- 2) A hot dog vender has studied his revenue ( $R(x)$ ) and cost ( $C(x)$ ) over the course of a month; each depends on the number of hot-dogs he sells. The following algebraic rules represent these two relationships where  $x$  represents the number of hot-dogs sold with revenue and costs measured in dollars.

$$R(x) = 1.75x$$
$$C(x) = 125 + .45x$$

- a) What can you tell about this situation from the revenue rule?
- b) What can you tell about this situation from the cost rule?
- c) What would be the profit rule? Explain how you arrived at this rule.
- d) How many hot-dogs would he have to sell in order to break even?
- e) What would happen to the **revenue** rule if the vender decided to sell hot-dogs for \$1.00? Explain how this change would affect the break-even point.
- f) Find this new breakeven point.

- g) If the vendor knew he could sell only 50 hotdogs, how much should he charge for each hot dog and why?

- 3) The basketball coach is planning the summer basketball camp. Each participant is charged a fixed amount for the camp. Each participant is given a T-shirt, and the coach has to pay seven student assistants \$50 each. The camp also gives awards for different skill competitions, so the coach must also purchase nine trophies at \$6 each.

Below are tables representing revenue and cost as functions of the number of players attending the camp.

Players	Coach's Revenue	Coach's Cost	Coach's Profit
10	\$250	\$454	
15	\$375	\$479	
20	\$500	\$504	
25	\$625	\$529	

- a) Complete the profit column in the table above.
- b) What is the coach's revenue and cost if no players attend the camp?
- Revenue =
  - Cost =
- c) Help the coach by writing rules for the following:
- Revenue =
  - Cost =
  - Profit =

d) How much does each player pay to attend the camp?

e) How much does each player's T-shirt cost?

f) How many players need to attend in order to break even?