

Revenue, Expenses, and the Break-Even Point

Student Content Document

Trevor is a typical high school student. He gets good grades, takes school seriously, and understands that hard work will make for a successful future. He would like to purchase a new, high-tech bike. However, it will take several hundred dollars and a lot of hard work for him to get it. One of Trevor's chores around the house is to maintain the lawn. He has become very good at it and decides to turn his ability into a lawn mowing business. He starts by planning out his business strategy and outlines some facts.

The business will require equipment

- Lawn mower, weedwacker, broom, or leaf blower.
 - The cost of this equipment, even used, will be several hundred dollars.
 - He will need to sign an agreement to rent the equipment.
 - His equipment will require gasoline.
 - The average price of gasoline is \$3.80 per gallon.

Clients must be located near his home

- He has no transportation to move himself and his equipment to each client.
- Clients must be close enough for him to easily transport his equipment and get the job done in a reasonable amount of time.
- Marketing efforts will focus in his neighborhood of approximately 200 homes.

School commitments

- He can't let the business impact his grades.
- School ends mid-afternoon.
 - Cutting lawns requires daylight.
 - He will have about four hours to work after school.
 - Weekends will be saved in case a day during the week is rained out.
 - Cutting his family's lawn takes about 40 minutes and is similar size to those in the neighborhood.

Trevor creates a to-do list

- Secure an agreement to rent equipment.
- Create a flyer announcing the creation of his new lawn mowing business.
- Distribute flyers throughout the neighborhood.
- Prepare to work immediately.

Has Trevor forgotten anything? Are there some things you'd do differently?

Over the next few days, Trevor makes progress. He secures an agreement to use lawn equipment consisting of a lawn mower, a weedwacker, a leaf blower, one-gallon gas cans (2) (one for gas to power the lawn mower and one for a gas/oil mixture to power the weedwacker and leaf blower), and a five-gallon gas can for refueling.

He has agreed to pay \$50 per week for use of this equipment. Trevor completed his flyer announcing his new business and has distributed them to the 200 homes in his neighborhood. Trevor needs answers to some questions:

- How much money will I make each week?
- How many lawns must I cut to cover my costs?
- How much profit will I make?
- How long will it take me to earn enough for my bike?

Trevor recalls some basic business terminology and formulas he learned in school:

$$\underline{\text{Revenue} = \text{Expenses} + \text{Profit}}$$

$$\text{Revenue} = (\text{Price charged for a service}) \times (\text{Number of clients})$$

$$\text{Revenue} = Px$$

P = Price

x = Number of clients

$$\underline{\text{Expenses} = \text{Fixed costs} + \text{Variable costs}}$$

$$\text{Expenses} = FC + Vx$$

FC = Fixed costs

V = Cost per client

x = Number of clients

$$\underline{\text{BEP (Break-Even Point)}}$$

$$\text{Revenue} = \text{Expenses with no profit}$$

$$\text{BEP} = \text{Revenue} = \text{Expenses}$$

$$Px = FC + Vx$$

His fixed costs are \$50 per week (the cost he agreed to pay to rent the equipment). This cost will not change regardless of how many lawns he mows.

Variable cost will be the cost of the gasoline he uses to cut each lawn. Typically, Trevor uses ½ gallon of gas to fill the mower and the other equipment to cut his family's lawn. At \$3.80 per gallon, Trevor's variable cost will be \$1.90 per lawn.

$$\text{Trevor's expenses: } FC + Vx = \$50 + (\$1.90)x$$

x = number of lawns

How much should Trevor charge to cut one lawn? What will be his BEP?

Lawns Mowed	Expenses FC + Vx	Price Charged BEP
1	$50+(1.90)(1) = 51.90$	\$51.90
2	$50+(1.90)(2) = 53.80$	\$26.90
3	$50+(1.90)(3) = 55.70$	\$18.57
4	$50+(1.90)(4) = 57.60$	\$14.40
5	$50+(1.90)(5) = 59.50$	\$11.90

Trevor sees that having just one client would mean he would have to charge more than \$50 to cut the lawn to break-even. Pricing his service above \$50 would make his service expensive and would limit his ability to attract more customers. The lower his price the more customers he may get. But Trevor is starting the business to make a profit, not to break-even, so how can he balance his price and still make a profit? Trevor remembers an important term used in BEP analysis: contribution margin (the amount of revenue available for use in paying the business's fixed costs).

Contribution margin = Revenue - Variable costs

Subtracting the per-unit costs (variable costs) from the earned revenue leaves the contribution margin. If the contribution margin is less than the fixed costs, the break-even point has not been reached, and money is lost. When contribution margin equals fixed costs, the BEP is reached. If contribution margin exceeds fixed costs, there is a profit. Once Trevor's contribution margin exceeds \$50, he will be making a profit, which he can put toward the purchase of the bike.

Trevor needs to calculate the contribution margin at different price levels to determine which price is best to charge for cutting each lawn.

Contribution Margin for Price Charged

Price	Lawns Mowed	2	3	4	5
\$30		$\$60 - \$3.80 =$ \$56.20	$\$90 - \$5.70 =$ \$84.30	$\$120 - \$7.60 =$ \$112.40	$\$150 - \$9.50 =$ \$140.50
\$25		$\$50 - \$3.80 =$ \$46.20	$\$75 - \$5.70 =$ \$69.30	$\$100 - \$7.60 =$ \$92.40	$\$125 - \$9.50 =$ \$115.50
\$20		$\$40 - \$3.80 =$ \$36.20	$\$60 - \$5.70 =$ \$54.30	$\$80 - \$7.60 =$ \$72.40	$\$100 - \$9.50 =$ \$90.50
\$15		$\$30 - \$3.80 =$ \$26.20	$\$45 - \$5.70 =$ \$39.30	$\$60 - \$7.60 =$ \$52.40	$\$75 - \$9.50 =$ \$65.50

The more clients Trevor has, the less he can charge for his service, and still make a profit. His contribution margin must exceed \$50 for Trevor to make a profit. From the table, it is clear that if he only has two lawns to mow he must charge at least \$30 per lawn to make a

profit. He could charge \$20 per lawn with three clients and \$15 per lawn once he has more than three clients.

Comprehension check

- What would Trevor's contribution margin be if he charged \$25 per lawn and was cutting eight lawns each week?
- \$20 per lawn with a dozen clients?

In order for Trevor to determine the best price for his service, he must first know how many clients he will have.

- What if each of the 200 homes hired him? If it takes him 40 minutes to cut a lawn properly and another 10 minutes to transport his equipment to the next client, could Trevor service all 200 clients?

Another fundamental business practice is quality customer service. Trevor realizes that each day won't be suitable for mowing lawns, so it is inevitable that weather will eventually cancel his daily commitments. As back up, he keeps Saturdays open. That will leave him eight hours available to catch up should weather postpone his appointments during the week. If it rains on Monday, he'll cut his Monday lawns on Tuesday, his Tuesday lawns on Wednesday, and so on. Saturday could be used to cut his Friday lawns and still service all of his weekly clients.

- If Trevor can't successfully take on all 200 clients, how many can he handle?
- Trevor fills his schedule, pricing his service at \$20 per lawn. What will be his contribution margin?
- Is he making a profit?
- If we assume his bike (including tax and accessories) costs \$500, how long until Trevor can go purchase it?
- Assuming a full schedule, charging \$25 per lawn, recalculate contribution margin, profit, and time until bike purchase.
- What would be the pros and cons of each price decision?

Let's say Trevor fills his schedule and keeps happy clients.

- Do you think he will continue to grow his client base?
- Instead of Trevor refusing work, what else can he do?
- How would the numbers look?
 - What numbers would change?
 - What would the numbers look like for Trevor?
- Trevor could one day expand outside his neighborhood.
 - What considerations are there to expanding his geographic area?