Economic Analysis - Engineering

January 18, 2024

1 Revenue, Cost, Profit

1. $Profit = Revenue - Cost$

1.1 Example 1

Ace Manufacturer is a major player in the lawn sprinkler business. To produce these sprinklers Acme's fixed cost is $55,000 per most for the production. The variable cost for each sprinkler is $15.50 per unit. The selling price for these sprinklers is fixed at $60 per unit. Acme has the capacity to produce 3,000 units per month.

1. What is the maximum profit Acme can expect at full capacity?
2. If acme produces 1000 sprinklers per month, will the company experience a profit or loss?

1 .
$x = 3000$
$Profit = Revenue - Cost$
$\{(\frac{3000 sprink}{month})(\frac{60}{sprink}) - \frac{55000}{month} - (\frac{3000 sprink}{)} month)(\frac{15.50}{sprink})\} = \$78,500$

2. $x = 1000$
$Profit = (1000)(60) - 55000 - (1000)(15.50) = -10,500$

1.2 Problem 1

Scoot-Yer-Boot produces parts for electric scooters. One of the parts they produce is the fork (connects the handle to the front wheel). Consider the following information about the production process:
Fixed production costs **$53,000 per month**

Metal to make one fork **$18 per fork**
Number of forks made each day **870 forks per day**
Percent of forks that pass quality inspection (are usable) **90%**
Selling price of usable forks **$32 per fork**

1. Assuming there are 20 Production days per month, what is the expected monthly profit?

1.
$Profit = (\frac{\$32}{fork})(\frac{870forks}{day})(\frac{20days}{month})(\frac{9}{10}) - (\frac{\$18}{fork})(\frac{870forks}{day})(\frac{20days}{month}) - (\frac{\$53{,}000}{month})$

1.3 Problem 2

The owners of a mine are trying to estimate the profitability of a mine containing **100,000 tons of ore**. The ore recovery method being considered will result in the removal of **61,000 tons of ore** and will cost **$21 per ton of ore removed**. Subsequent processing of the removed ore results in **300 lbs of metal per ton of ore** processed. The cost of this processing is **$45 per ton of ore** processed. The recovered metal can be sold for **$0.83 per lb.**
1. What is the expected total profit from the mine?
$Profit = (61,000tons) * (3/10) * (\frac{2000lb}{ton})(\$0.83/lb) - (61000tons)(\$21/ton) - (61,000tons) * (\$45/ton)$