

Homework 1

Problem 1.1

You are setting up a part-time business with an initial investment of \$20,000 for capital. The unit cost of the product is \$12 and the selling price is \$20.

- (a) What is your Total Cost (TC) equation?
- (b) What is your Total Revenue (TR) equation?
- (c) Find the break-even quantity (q)?
- (d) What profit (π) does this break-even quantity yield? In other words, what would your profit be if you produced and sold the quantity in part c)?
- (e) What quantity will yield $\pi = \$4,000$? In other words, how much would you have to sell and produce to make $\pi = \$4,000$?

Problem 1.2

For the following equations, how many units (q) must the company produce and sell to break-even?

- (a) $TR = 5q$, $TC = 2.5q + 10,000$

(b) $TR = 40q$, $TC = 8q + 500,000$

(c) $TR = 150q$, $TC = 110q + 20,000$

Problem 1.3

You have two options. Option 1: Keep your current job with an annual salary of \$40,000. Option 2: Take 4 years off from work and go to school or $Y_0 = 4$. The cost of tuition and all other expenses would total to \$50,000 but your potential earning salary afterwards would be \$70,000. How many years would it take you to break-even at the start of your decision?

(a) $\text{Job}_1 = 40,000(Y_1)$, $\text{Job}_2 = 70,000(Y_1 - Y_0) - 50,000$