

Problem Set 1
HONORS 259L

Due September 11 in class.

(Two of these questions will be graded.)

Some candidate answers.

- 1) You are considering a road trip to the Eastern Shore for Columbus Day. You are deciding among going to St. Michaels, to Ocean City or staying in College Park. (If you are not familiar with this trip, consult Googlemaps). For your travel costs, provide examples of avoidable fixed costs, variable costs and sunk costs. Do this for two cases, in case 1 you have to rent a car, in Case 2, you already own a car. (Note that to get to the Eastern Shore, you will need to cross the Bay Bridge which has a toll.)
 - a) *Some examples of fixed costs: car rental fee, additional insurance, Bay Bridge toll fee (all avoidable in Case 1 if your second best choice is to stay in College Park since you may choose not to go. However, if your first choice is either SM or OC while your second best choice is the other of those two, these costs are not avoidable since, given you are going on the trip, you will pay them in either case. They are all sunk costs in Case 2 except for the toll). A Case 1 sunk cost might be the rental fee after you rent the car for the day but choose not to go away (rental companies rarely give refunds)*
 - b) *Some examples of variable costs: gas costs, for both cases, wear and tear on the car for Case 2, additional mileage costs (if applicable) for case 1.*

- 2) You are considering getting up at 4am to join a group of friends bird-watching. Determine what type of cost (benefit) category the following fall into:
 - i) *The pain of waking up so early. Avoidable FC*
 - ii) *The cost of your 2 year old binoculars (original cost \$200, predicted lifespan, 4 years) Sunk Cost.*
 - iii) *The cost of disappointing your friends by not showing up. This is really an avoidable Benefit from the standpoint of the "costs" of going birdwatching since when you go birdwatching, you benefit from this feature. It is fixed rather than variable though.*
 - iv) *The cost of Petersons Bird-watching Guidebook. Avoidable fixed cost if you have not yet purchased the book, sunk cost if you have already purchased it.*
 - v) *The number of hours being bored watching birds. VC.*
 - vi) *The time cost of developing your interesting group of friends. Variable Benefit.*

- 3) Suppose you are considering buying a brand new Honda Fit Sport w/ Navigation, well-fitted version priced at \$21,500. Edmunds.com lists used 2018 Honda Fit Sport with Navigation with 12,000 miles at \$19,400 which means you could probably sell it to the dealer at say \$18,300. Since cars drop in price as soon as they leave the lot, you can likely also assume that the amount a dealer would give you for the same car with 10 miles is about the same. The car gets 30 miles per gallon. Determine the fixed, variable and sunk costs of driving the car x miles for the first year. *Note that $21500 - 18300$ is 3200.*
 - a) *measured before you actually leave the lot Before you leave the lot, the fixed cost of driving around x miles is \$3200 in terms of the difference between what you pay for the car and what you can sell it for. This is avoidable since if you choose not to drive at all, you do not have this cost. Additional examples might be the insurance (part of this could be thought of as variable since some insurance policies depend on the number of miles driven) are the foregone interest on the full purchase price of \$21500 over the year (or the interest you pay on a loan for the amount you borrow.). The gas cost is variable since if you drive $\$x$ or $2x$ the costs go up accordingly.*
 - b) *measured after you have paid for the car and drove it the ten miles home. Here, the main change is that the loss in value of the car of \$3200 is unavoidable, so it is sunk. The insurance cost could be thought of as avoidable since you can usually cancel the policy if you choose not to drive it. The variable costs remain the same. The lost interest on the resale price of \$18,300 though are a variable cost in the sense that as soon as you sell the car, you can start earning interest on it..*

- 4) You have just spent 2 hours cleaning your kitchen. You will not clean for another week. You are considering whether to invite a friend to dinner resulting in a messy kitchen. Is the cleaning time a sunk cost? Should that factor in your decision to invite the friend? Why or why not? *The tendency might be to think that since you have already sunk the cost of cleaning, it should not factor in the decision. However, there is an avoidable cost of inviting the friend which is having to put up with a messy kitchen for a full week whereas if you had not cleaned yet, (or never intended to clean) there is relatively little incremental change in the status of the kitchen with an invitation than without so my tendency is to say yes this information IS relevant.*
- 5) (Optional) Suppose you are a producer of DVD blank disks. To produce Q units per month costs you $\$100 + 0.25Q^2$.
- What are the fixed costs of production? *Even with $Q = 0$, costs are $\$100$ so $FC = 100$*
 - What are the marginal costs of producing discs when you are currently producing 10 units? 15 units? 20 units? 30 units? *$MC = dC/dQ = .5Q$ so the answers are 5, 7.5, 10 and 15.*
 - What are the average costs of producing disks ($AC = TC/Q$) when you are currently producing 10 units? 15 units? 20 units? 30 units? *$AC = C/Q$ so the answers are 12.5, $156.25/15 = 10.4$, $200/20 = 10$, $325/30 = 10.8$. Observe that at $Q = 20$, $MC = AC$. For $Q < 20$, AC is falling and $MC < AC$ for $Q > 20$, $MC > AC$ and AC is rising. This is a general property.*