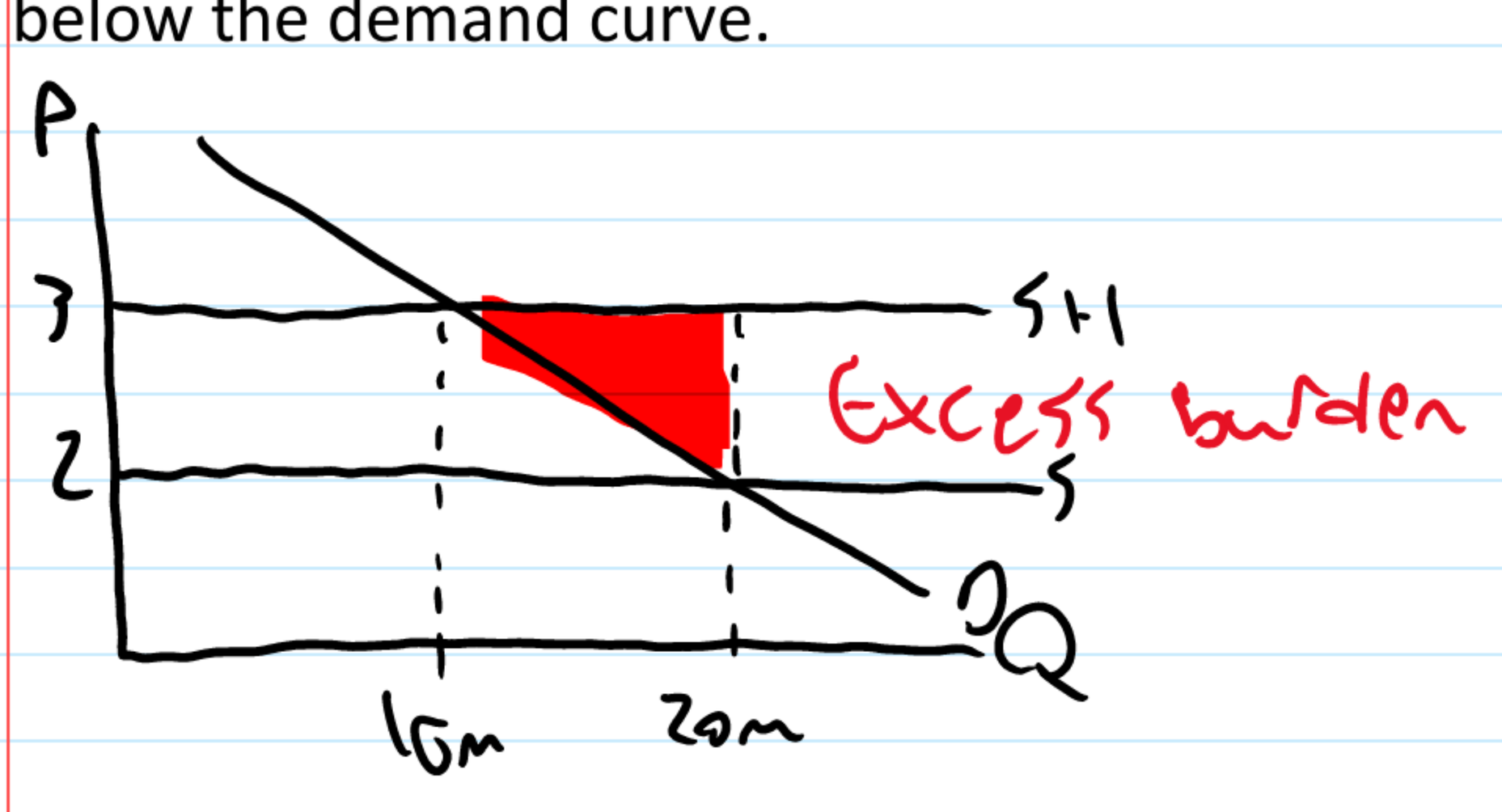
Final

Thursday, December 10, 2020 8:00 AM

1. Briefly answer each of the following. 2.9

a) Why does taxation create an excess burden? Be precise, and draw a figure to illustrate.

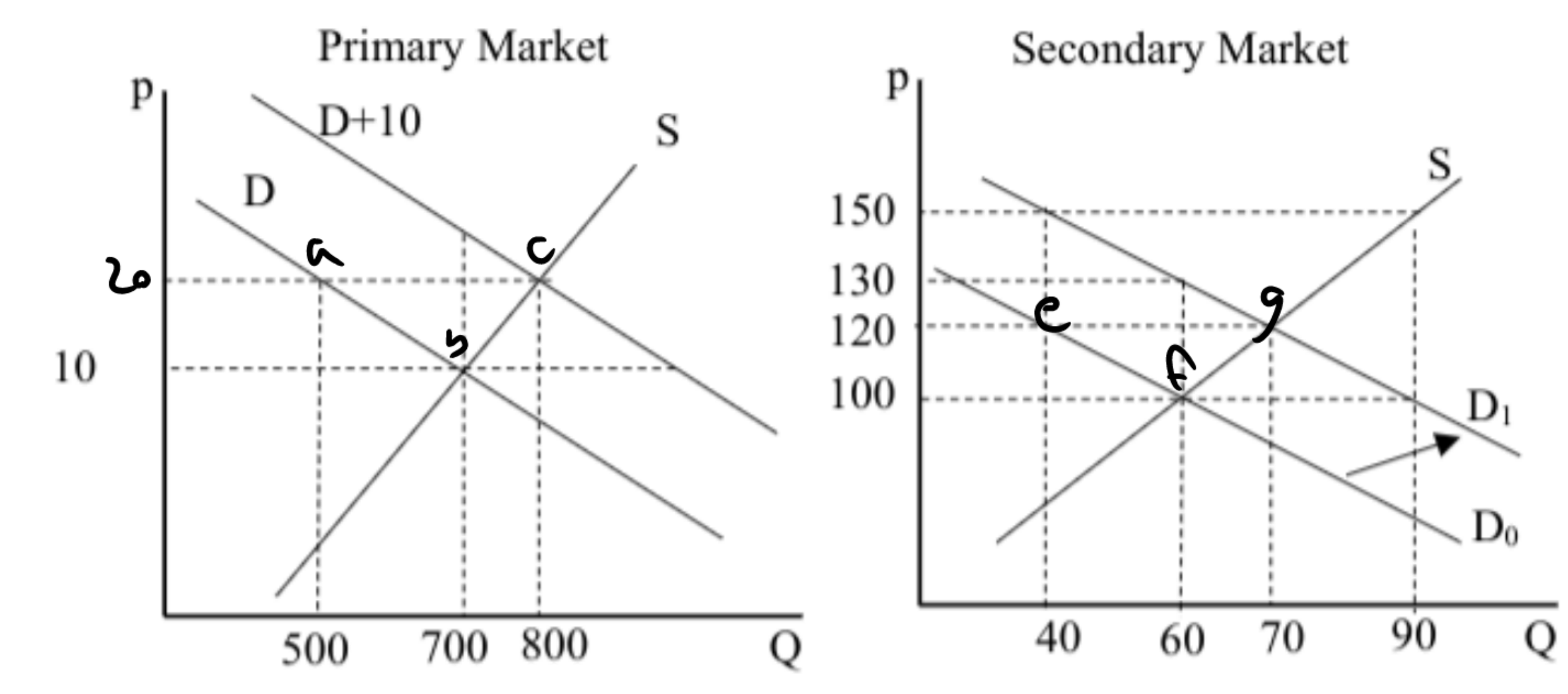
Excess burden of tax, also known as deadweight loss, is the loss in opportunity created by not being able to spend your money on goods or services but instead having to pay taxes. Changes in both demand or supply can create an excess burden. The excess burden can also appear above or below the demand curve.



b) What is existence value? Is it clearly distinct from what the book calls "option value"? Why or why not?

Existence value is the value gained from something simply existing. For example, I have never been to Yellowstone national park, but it brings me joy that the region recovered after wolves were re-introduced to the area some years ago. Existence value is non-rivalrous and non-excludable. Just because it brings me joy doesn't mean it can't also bring you joy. Existence value is simply a part of option value. Option value includes use value and non-use value, non-use value is the same as existence value. It has value to you even though you're not using it.

2.2 2. The impact of a government purchase 200 units is depicted in the primary market in the accompanying figure. The elasticity of demand is -3. The MEBT is 0.2.



a) What is the primary market impact?

$(10 \cdot 500) + (\frac{1}{2} \cdot 10 \cdot 200) = \Delta CS = 6000$

$\Delta CS + \Delta PS = a \cdot b \cdot c = (\frac{1}{2} \cdot 200 \cdot 10) + (\frac{1}{2} \cdot 100 \cdot 10) = 1000 + 500 = 1500$

$\Delta SS = 6000 - 1500 = 4500$ $\quad NB = 10 \cdot 200 = 2000$

b) The secondary market good is a substitute for the primary market good, so the increase in price in the primary market increased demand in the secondary market. What is the secondary market impact that is not already accounted for in the primary market impact? Explain what this impact represents and why we add it to the primary impact in calculating net benefits.

$NB = (20 \cdot 10) = 200$

This impact represents the effects of the primary market on the secondary market. Because the secondary market good is a substitute for the primary market, if prices rise in the primary market, demand will increase in the secondary market provided that it's at a lower cost. Because the secondary market prices changed, we add it to the primary market effect to make sure we are properly calculating all impacts of the primary market.

1.3 3. Briefly answer each of the following.

a) Explain precisely why secondary market impacts should be ignored when prices in the secondary market do not change.

If prices in the secondary market are not changing, secondary market impacts should be ignored because in this case impacts would be fully measured as surplus changes in the primary market. Therefore, measuring the effects in both markets would result in double counting.

b) Why don't large positive multiplier effects on local spending from events such as the Superbowl, or any sizeable local project or event, indicate the project's benefits exceed its costs, even locally? Hint: one important part of the answer has to do with secondary market effects, and you may want to reference question #2.

It is important to count everything only once and any multipliers count as double or more counting. In the case of a sporting event, while the money does initially get spent in the local community, it quickly leaves and the benefits diffuse through the same multiplier effect.

2.2 4. Consider a public project with a forecast period of 20 years. The discount rate is 3.5%. The net benefit in year 20 is forecast to be 10. You expect that each year from year 20, conditional on making it to year t≥20, there is only an 80% chance of continuing another year. Net benefits grow 2% per year as long as the project continues.

a) What discount factor (δ) would you use to calculate the horizon value for this indefinite continuation situation?

$\delta = (1.02 \cdot .8)/1.035 = .788$ after year 20

$\delta = 1.02/1.035 = .9855$ up to and 20

b) What is the horizon value?

$\delta/1-\delta = 3.726$

$(10 \cdot 1.02^{20} \cdot 3.726)/1.035^{20} = 27.825$

Not sure if this is correct or if I should be using infinity instead of 20 because it's perpetual

2.8 5. Suppose you have two job offers. Big Inc. will pay you $75,000. Small Ltd. pays $40,000 with profit sharing. You believe there are three possible states of the world. There is a 30% chance demand will be low and no profits will be shared. There is a 30% chance demand will be high and $80,000 will be shared. Otherwise demand will be medium and $40,000 will be shared. You are risk neutral and that other than pay the two jobs are the same to you.

a) Draw the normal form game against nature.

	Low demand	High demand	Medium demand	Exp Value
Probability	.3	.3	.4	
Quantity	0	80000	40000	
Big Inc 75000	=75k=75k	=75k=75k	=75k=75k	=(75k*.3)+(75k*.3)+(75k*.4)= 75k
Small Ltd 40000	=40k+0=40k	=40k+80k= 120k	=40k+40k=80k	=(40k*.3)+(120k*.3)+(80k*.4)= 80k

b) Which job is better?

Based purely on expected value, Small Ltd is better.

c) Suppose you can acquire information that will tell you for certain whether or not demand will be low. If demand is not low, it does not tell you whether it is medium or high. What is the value of such information to you?

$EV(Low) = (.3/.3)(75k) = 75k$

$EV(!Low) = (.3/.7)(120k) + (.4/.7)(80k) = 51428.57 + 45714.29 = 97142.86$

choose !Low

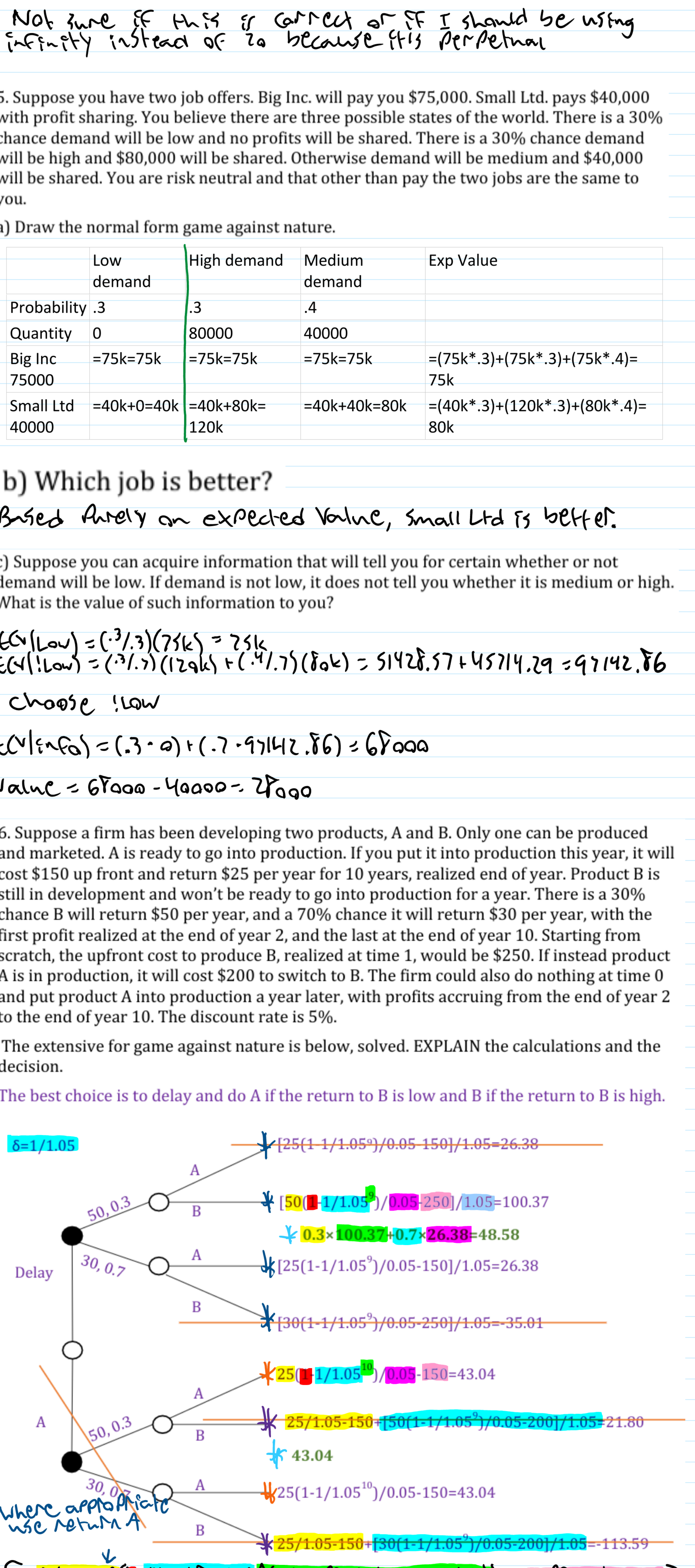
$EV(info) = (.3 \cdot 0) + (.7 \cdot 97142.86) = 68000$

Value = 68000 - 40000 = 28000

3.9 6. Suppose a firm has been developing two products, A and B. Only one can be produced and marketed. A is ready to go into production. If you put it into production this year, it will cost $150 up front and return $25 per year for 10 years, realized end of year. Product B is still in development and won't be ready to go into production for a year. There is a 30% chance B will return $50 per year, and a 70% chance it will return $30 per year, with the first profit realized at the end of year 2, and the last at the end of year 10. Starting from scratch, the upfront cost to produce B, realized at time 1, would be $250. If instead product A is in production, it will cost $200 to switch to B. The firm could also do nothing at time 0 and put product A into production a year later, with profits accruing from the end of year 2 to the end of year 10. The discount rate is 5%.

The extensive for game against nature is below, solved. EXPLAIN the calculations and the decision.

The best choice is to delay and do A if the return to B is low and B if the return to B is high.



* [return B(1-discount factor^(10 yr project - 1 yr delay)) / discount rate - upfront cost] / 1+discount rate

* Probability of $50/yr · benefits of $50/yr + Probability of $30/yr · benefits of $30/yr

* return a/1-discount factor^(10 yr project) / discount rate - upfront cost

* Calculate benefits of A for one year then B for 9 years

To find the best solution, start at the outermost branch and go in. At each level, eliminate the worst outcome. Once the base node is reached, choose the highest value.

↳ backwards induction

If we delay, Low B is -35.01 and high B is 100.37. A is 26.38. Thus, if B is Low, we choose A.