

Name: *Key*

**Instructions:** Answer all parts of all questions. You have 90 minutes to complete the exam. This exam is open note, but not open book. You are welcome to use any written materials that you might find helpful excluding textbooks. Calculators, but no other electronic devices, are allowed. Here are some things to keep in mind.

- i. Explain all of your answers. Unsupported answers will receive little or no credit.
- ii. On true/false questions, I only care about the quality of your explanation. Simply writing "true" or "false" will yield no credit.
- iii. Avoid extensive irrelevance, this will also cost you points. Your goal should be to provide clear and concise explanations.
- iv. It is more important to demonstrate that you understand the correct method. Minor math errors will result in only minor deductions.
- v. All parts of all questions are worth the same amount.
- vi. Many questions ask you about a deviation from something that we did in class. If you simply copy down what we did in class, I will award no credit.

1. Consider a household deciding whether to buy a new home. How does scarcity impact their decision?

Scarcity is represented by the household's budget constraint. This limits its spending to its income and assets. As a result, spending on a house reduces savings or spending on some other item.

2. True or False? If people are rational, then their decisions inevitably lead to socially desirable outcomes (e.g. efficiency).

False. In the case of market failures, rational actors lead to inefficient outcomes. One example is an

externality (others include public goods, market power, etc.), agents' failure to consider public benefits (costs) leads to too little (much) of the good.

3. What market failures contributed to the Aral Sea disaster?

There are different ways to frame this disaster which was conducted by the Soviet government. We can think of it as a government created externally where cotton farmers did not consider the impact of their water use on the sea. It is also an example of short-sightedness where too much emphasis was placed on the immediate benefits and not enough on the long-term costs.

4. Consider a good where one person's consumption does not prevent another from consuming it, and where it is impossible to stop anyone from consuming it. Why will a free market lead to too little of this good?

This is a public goods problem. Without an intervention (e.g. where the government provides the good), private agents may free ride and underprovide the good.

5. Why is the supply curve upward sloping in this example?  
 The ~~demand~~ supply curve is marginal cost. By assumption, there is increasing marginal cost where each additional house is more expensive to build than the previous house.

Table 1: Marginal Utility and Marginal Cost for New Houses

Units	Marginal Utility	Marginal Cost
1	100	20
2	100	40
3	80	50
4	70	60
5	65	65
6	50	80
7	30	100

For questions #5-7, refer to the following table:

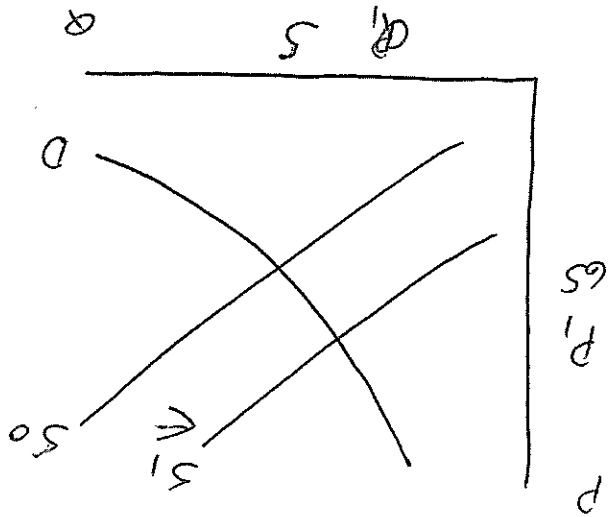
6. What are the equilibrium price and quantity in this example?

Equilibrium occurs where marginal cost equals

marginal utility, this occurs at  $Q = 5$  and  $P = 65$ .

7. Suppose that the price of lumber, an input in the production of houses, increases. How would this affect the price and quantity of new housing?

This is an increase in marginal cost.



The equilibrium price is higher than 65 and the (new) equilibrium quantity is less than 5.

8. Does higher inflation usually reduce or increase economic inequality?  
 Inflation can affect inequality in several ways. One is if wage inflation is lower than overall inflation, then firms will benefit at the expense of workers. This usually increases inequality. On the other hand, inflation may benefit borrowers at the expense of lenders. This may reduce inequality.

9. Why is 2021 GDP growth expected to be higher in the U.S. than Europe?

This is ~~the~~ mostly due to the comparative states of the covid-19 pandemic. The U.S. has imposed fewer public health restrictions and has vaccinated more of its population compared to Europe.

10. Our basic model of supply and demand assumes that firms are profit maximizers. Do you think that this is a valid assumption?

It depends. If we are modelling a market where firms are ordinary profit maximizers, then it is a valid approximation of the market. But this would not be the case for non-profit maximizers such as most colleges or charities.

11. What subfield of macroeconomics seeks to understand why global GDP was lower in 2020 than in 2019?

2020 versus 2019 is a short-term question. Business cycles are the study of short-run macroeconomic performance.

No, the relevant comparison is not Mexico before and after NAFTA. Other factors may explain the change in unemployment. Instead we need to examine the (harbor) comparison of Mexico after NAFTA versus a counterfactual of Mexico without NAFTA.

12. The North American Free Trade Agreement (NAFTA) went into effect on January 1, 1994. The treaty liberalized trade among the U.S., Canada, and Mexico. Is it valid to claim that NAFTA led to a rise in Mexican unemployment?

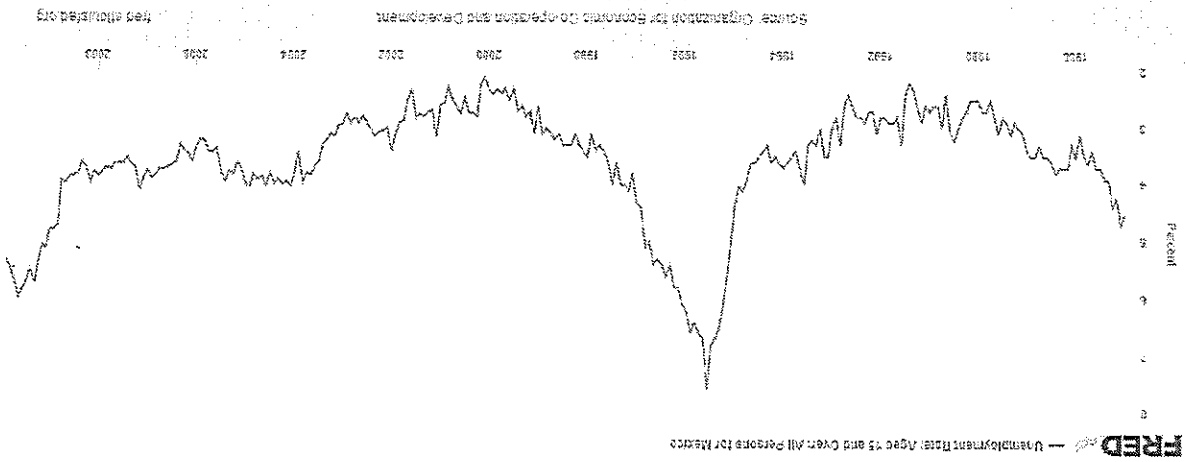


Figure 1: Unemployment Rate: Mexico

The following graph shows Mexico's unemployment rate:



$$N GDP_{20} = 4 \times 6 + 4 \times 2 + 9 \times 8 = 104$$

Service

We exclude sushi rice (intermediate good) and stock shares which are a financial transaction that does not represent the production of a good or service

counted.

13. Calculate nominal GDP for 2020. In doing so, explain why any items from the Table are not

	Q(2020)	P(2020)	Q(2021)	P(2021)
Business Equipment	4	6	3	9
Sushi	4	2	3	3
Sushi Rice (used to make sushi)	4	1	3	1
Stock Shares	14	3	5	5
Education	9	8	2	10

Table 2: Economic Activity in the U.S.

For Questions #13-16 use the following data:

unfavorable guess.

\* Some students put education in investment. They did not lose points as this is an

$$CPI_{21} = 4 \times 3 + 9 \times 10 = 108$$

$$\sqrt{\frac{108 - 70}{70}} = 45.7\%$$

$$CPI_{20} = 4 \times 2 + 9 \times 8 = 70$$

goods (other choices are reasonable).

This includes sushi and education. I will use 4 units of sushi and 9 of education as the basket of

tion. Use this index to calculate inflation in 2021.

15. Construct a basket of goods and services which includes only the items included in consump-

$$GDP \text{ growth} = \frac{56 - 138}{138} = -59.4\%$$

(also nominal GDP for 2021)

$$rGDP_{21} = 3 \times 9 + 3 \times 3 + 10 \times 2 = 56$$

(~~also~~ uses 2020 quantities and 2021 prices)

$$rGDP_{20} = 9 \times 4 + 3 \times 4 + 9 \times 10 = 138$$

14. Calculate real GDP growth in 2021 using 2021 as the base year.

Bonus: Using the data from the table, explain how GDP's exclusion of non-market activity in 2021 could cause 2021 GDP growth to be artificially low. In answering this question, consider how the covid-19 pandemic has affected some of the items from the table.

we might consider education which fell from 9 units in 2020 to 2 units in 2021. It is possible that because of school closures, the decline is really a switch from education provided in a formal market to non-market education (e.g. homeschooling). This would then exaggerate the decline in economic activity.