

MC _____
EXE 1 _____
EXE 2 _____
EXE 3 _____
TOTAL _____

Econ 002- INTRO MACRO Prof. Luca Bossi December 13, 2013

FINAL EXAM -SUGGESTED SOLUTIONS-

My signature below certifies that I have complied with the University of Pennsylvania's Code of Academic Integrity in completing this examination. In particular, I declare that I have not used a graphing calculator to complete this exam, nor notes and any material.

Name (printed)

Penn ID

Signature

Date

INSTRUCTIONS

The exam is closed book. It is composed of 40 multiple choice questions and three exercises. All multiple choice questions are worth 1.5 points (so the total is 60 points for the multiple choice part). You can detach the answer sheet for the MC part at the end of the exam if this is more comfortable for you. If that is the case, be sure to put your name on it and to tell your TA to staple it back to the exam when finished. If you do not fill in the MC part on time and request extra time at the end of the exam to write the answers up, a proctor will take your name and you will receive a penalty of 5 points. **ANSWER ALL QUESTIONS.**

TOTAL POINTS = 100. TOTAL TIME = 120 minutes

Provide your answers on the exam sheet directly. Read all questions very carefully. Write legibly.

EXAM TAKING POLICY

If you need to use the restroom, raise your hand and wait for the proctor to come to you. Only one person can be out of the examination room at a time, and the proctor will hold onto your exam papers while you are out at the restroom.

FOR THE DURATION OF THE EXAM, AND WITH THE EXCEPTION OF YOUR ALLOWED SCIENTIFIC CALCULATOR, YOU HAVE TO TURN OFF EVERYTHING ELSE THAT HAS A POWER BUTTON. NO CELL PHONES. NO BOOKS. NO NOTES. NO HELP SHEETS. NO TALKING TO EACH OTHER. YOU CANNOT CONNECT TO THE INTERNET.

NO ASKING THE PROCTORS ANY QUESTION OR HELP TO SOLVE THE EXAM.

WRITE IN PENCIL OR IN PEN AS YOU LIKE, BUT IF YOU WRITE IN PENCIL THERE IS NO POSSIBILITY TO ASK FOR RE-GRADING. PLEASE WRITE YOUR NAME ON EVERY SINGLE PAGE OF THE EXAM.

PLEASE FOLLOW THE INSTRUCTIONS AS TO HOW TO SUBMIT YOUR EXAM AT THE END OF THE 60 MINUTES.

PLEASE DO NOT START THIS EXAM UNTIL INSTRUCTED TO DO SO.

GOOD LUCK!

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EXERCISE I (15 points)

In Jupiter's economy, inflation increased between 2010 and 2013 by 2 percentage points each year, velocity was constant, and production increased by 10% each year. Complete the following chart about Jupiter's economy. Round to two decimal places as necessary.

Year	Production	Velocity	Money Supply	Price Level	Inflation Rate
2010				10	N/A
2011	11				
2012		10			7%
2013					

Solution:

Fill in the Production column based on the 10% increase in production each year.

Fill in the Velocity column based on constant velocity.

Fill in the inflation column based on the 2 percentage point increase each year.

Determine the price levels based on the inflation rate for that year.

$$\text{Inf}_{2011} = (P_{2011} - P_{2010}) / P_{2010} * 100 \rightarrow 0.05 = (P_{2011} - 10) / 10 \rightarrow P_{2011} = 10.5$$

$$\text{Inf}_{2012} = (P_{2012} - P_{2011}) / P_{2011} * 100 \rightarrow 0.07 = (P_{2012} - 10.5) / 10.5 \rightarrow P_{2012} = 11.24$$

$$\text{Inf}_{2013} = (P_{2013} - P_{2012}) / P_{2012} * 100 \rightarrow 0.09 = (P_{2013} - 11.24) / 11.24 \rightarrow P_{2013} = 12.25$$

Determine the money supply using the Quantity Equation ($V = P*Y/M$, so $M = P*Y/V$)

$$M_{2010} = (P_{2010} * Y_{2010}) / V_{2010} = (10 * 10) / 10 = 10$$

$$M_{2011} = (P_{2011} * Y_{2011}) / V_{2011} = (10.5 * 11) / 10 = 11.55$$

$$M_{2012} = (P_{2012} * Y_{2012}) / V_{2012} = (11.24 * 12.1) / 10 = 13.60$$

$$M_{2013} = (P_{2013} * Y_{2013}) / V_{2013} = (12.25 * 13.31) / 10 = 16.30$$

Year	Production	Velocity	Money Supply	Price Level	Inflation Rate
2010	10	10	10	10	N/A
2011	11	10	11.55	10.5	5%
2012	12.1	10	13.60	11.24	7%
2013	13.31	10	16.30	12.25	9%

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EXERCISE II (15 points total)

Use two decimals when needed in this exercise.

Country X has a population of 10 million people, of which 7 million are in the labor force. 3 million people work in construction, 2 million people work in services, and 1 million people are unemployed.

a) (3 POINTS) Assuming that the fraction of unemployed construction workers with respect to total number of unemployed people is the same as the fraction of employed construction with respect to the total population; and the fraction of unemployed service workers with respect to total number of unemployed people is the same as the fraction of employed service workers with respect to the total population, how many construction workers are unemployed? How many service workers?

b) (3 POINTS) Calculate the unemployment rate for construction and service workers in Country X.

c) (3 POINTS) Suppose that the construction industry faces reduced demand, and is forced to lay off 2 million workers. 1.5 million of them stay in the labor force, while .5 million, discouraged by the layoffs, exit the labor force. Calculate the unemployment rate in Country X.

d) (3 POINTS) Suppose now that the economy in Country X enters recession, forcing the service industry to lay off 1 million workers (in addition to the construction workers laid off before). All the laid off service workers stay in the labor force, but the 1.5 million previously laid-off construction workers that were still in the labor force, unable to find jobs, now exit. What is the unemployment rate now? Does the new unemployment rate signal an economy that is improving?

e) (3 POINTS) Suppose that there is a third sector in the economy. This sector did not suffer any job gain or losses for the recession. This sector is the IT sector. How many workers are employed in this sector before and after the recession assuming that the population has not grown at all?

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Answers

a) The fraction of employed construction workers with respect to the total population = $(3/10)*100 = 30\%$

The fraction of employed service workers with respect to the total population = $(2/10)*100 = 20\%$

Hence 20% of 1 million = 200,000 are the unemployed service workers.

And 30% of 1 million = 300,000 are the unemployed construction workers

b) For service workers: there are 200,000 unemployed

The labor force in the service industry is $200,000 + 2\text{mil} = 2.2\text{ mil}$

Unemployment rate for service workers = $200,000/2,200,000)*100 = 9.09\%$

For construction workers there are 300,000 unemployed

The labor force in the construction industry is:

$300,000 + 3\text{mil} = 3.3\text{mil}$

$(300,000/3,300,000)*100 = 9.09\%$

c) $((1+2-.5)/(7-.5))*100 = 38.5\%$

d) New unemployment rate.

1 mil new laid off service workers + 1 mil of the originally unemployed workers = 2mil of overall unemployed workers. The construction industry workers do not enter the count of unemployed anymore because they all exited the labor force now so:

$((1+1)/(7-.5-1.5))*100 = 40\%$

e) You know that labor force before recession = 7mil.

Unemployed before recession = 1mil.

So total employed = $7-1 = 6\text{mil}$.

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Of these 6mil., 5mil. were either in the service sector or in the construction sector and since there is only one other sector in the economy, the IT sector, it must be the case that 1mil were employed before the recession.

The population has not grown and the IT sector has not lost or gained jobs hence after the recession there are still 1 mil employed workers.

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EXERCISE III (10 POINTS)

Use two decimals when needed in this exercise.

Consider the price of the recently released Xbox One in different countries:

	Cost of Xbox One	Nominal Exchange Rate
United Kingdom	£429	0.62
Australia	599 Australian Dollars	1.09
France	€499	0.74
United States	\$499	1

Note that the exchange rates are in foreign currency per US dollar in the table above.

a) (2 POINTS) Using the nominal exchange rates, find the country in which the Xbox One is the most expensive in term of US dollars.

b) (2 POINTS) Calculate the cost of a US Xbox One in terms of foreign Xbox Ones for each country.

c) (6 POINTS) Now you know that the Purchasing Power Parity Basket (PPP) cost 100 dollar in the US, 105 euro in France, 109 Australian dollars in Australia and 200 British Pounds in UK.

For each country compute the cost of the XBox One in Australian dollars using PPP exchange rates.

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Answers:

a) Divide costs of Xbox One in each country by nominal exchange rate. Most Expensive is in the UK.

b) Use formula $e = PE/P^f$

	Cost of XB1 in USD	e
United Kingdom	\$691.94	$0.72 = (499*0.62)/429$
Australia	\$549.54	$0.91 = (499*1.09)/599$
France	\$674.32	$0.74 = (499*0.74)/499$
United States	\$499	1

c)

	PPP Exchange Rate with AUD	Cost of Xbox One using PPP
United Kingdom	$200/109 = 1.83$	$=429/1.83=AUD 234,43$
Australia	$109/109 = 1$	AUD 599
France	$105/109 = 0.96$	$=499/0.96=AUD 519.79$
United States	$100/109 = 0.92$	$=429/1.83=AUD 542.39$

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MULTIPLE CHOICE QUESTIONS

Identify the letter of the choice that best completes the statement or answers the question. Write your answer in the answer sheet for the MC provided on the last page of the exam.

The Stock Market Boom of 2015

Imagine that in 2015 the economy is initially in long-run equilibrium. Then stock prices rise more than expected and stay high for some time.

1) Refer to Stock Market Boom 2015. Which curve shifts and in which direction?

- a. aggregate demand shifts right
- b. aggregate demand shifts left
- c. aggregate supply shifts right
- d. aggregate supply shifts left.

2) Refer to Stock Market Boom 2015. In the short run what happens to the price level and real GDP?

- a. both the price level and real GDP rise.
- b. both the price level and real GDP fall.
- c. the price level rises and real GDP falls.
- d. the price level falls and real GDP rises.

3) Refer to Stock Market Boom 2015. What happens to the expected price level and what impact does this have on wage bargaining?

- a. The expected price level falls. Bargains are struck for higher wages.
- b. The expected price level falls. Bargains are struck for lower wages.
- c. The expected price level rises. Bargains are struck for higher wages.
- d. The expected price level rises. Bargains are struck for lower wages.

4) Refer to Stock Market Boom 2015. In the long run, the change in price expectations created by the stock market boom shifts

- a. long-run aggregate supply right.
- b. long-run aggregate supply left.
- c. short-run aggregate supply right.
- d. short-run aggregate supply left.

5) Refer to Stock Market Boom 2015. How is the new long-run equilibrium different from the original one?

- a. the price level and real GDP are higher
- b. the price level and real GDP are lower.
- c. the price level is higher and real GDP is the same.
- d. the price level is the same and real GDP is higher.

6) In 1998 the Russian government defaulted on its bonds. According to the open-economy macroeconomic model, this should have

- a. increased Russian interest rates and net exports.
- b. reduced Russian interest rates and net exports.
- c. increased Russian interest rates and reduced Russian net exports.
- d. reduced Russian interest rates and increased Russian net exports.

7) Which of the following could explain a decrease in the U.S. real exchange rate?

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- a. the U.S. government budget deficit rises
- b. the U.S. impose import quotas
- c. **the default risk of U.S. assets rise**
- d. All of the above are correct.

8) Which of the following will decrease U.S. net capital outflow?

- a. capital flight from the United States
- b. **the government budget deficit increases**
- c. the U.S. imposes import quotas
- d. None of the above is correct.

9) Which of the following is most likely to increase exports?

- a. a reduction in domestic political instability
- b. **ending investment tax credits**
- c. a reduction in the size of the government's budget surplus
- d. None of the above will increase exports.

10) On behalf of your firm, you make frequent trips to Hong Kong. You notice that you always have to pay more dollars to get enough local currency to get your nails manicured than you have to pay to get manicured in the United States. This is

- a. **inconsistent with purchasing-power parity, but might be explained by limited opportunities for arbitrage in manicuring across international borders.**
- b. consistent with purchasing-power parity if prices in Hong Kong are rising more rapidly than prices in the United States.
- c. consistent with purchasing-power parity if prices in Hong Kong are rising less rapidly than prices in the United States.
- d. None of the above is correct.

11) If U.S. citizens decide to purchase more foreign assets at each interest rate, the U.S. real interest rate

- a. increases, the real exchange rate of the dollar appreciates, and U.S. net capital outflow decreases.
- b. **increases, the real exchange rate of the dollar depreciates, and U.S. net capital outflow increases.**
- c. decreases, the real exchange rate of the dollar depreciates, and U.S. net capital outflow decreases.
- d. decreases, the real exchange rate of the dollar appreciates, and U.S. net capital outflow increases.

12) During a presidential campaign, the incumbent argues that he should be reelected because nominal GDP grew by 12 percent during his 4-year term in office. You know that population grew by 4 percent over the period and that the GDP deflator increased by 6 percent during the past 4 years. You should conclude that real GDP per person

- a. grew by more than 12 percent.
- b. **grew, but by less than 12 percent.**
- c. was unchanged.
- d. decreased.

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Table 1

Bolivian Trade Flows			
Goods		Services	
Purchased Abroad	\$40 billion	Purchased Abroad	\$20 billion
Sold Abroad	\$10 billion	Sold Abroad	\$25 billion

13) Refer to Table 1. What are Bolivia's exports?

- a. \$60 billion
- b. **\$35 billion**
- c. \$10 billion
- d. None of the above are correct.

14) Refer to Table 1. What are Bolivia's imports?

- a. **\$60 billion**
- b. \$35 billion
- c. \$40 billion
- d. None of the above are correct.

15) Refer to Table 1. What are Bolivia's net exports?

- a. \$30 billion
- b. \$5 billion
- c. -\$5 billion
- d. **-\$25 billion**

16) When inflation rises, the nominal interest rate

- a. rises, and people desire to hold more money.
- b. **rises, and people desire to hold less money.**
- c. falls, and people desire to hold more money.
- d. falls, and people desire to hold less money

17) Suppose one year ago the price index was 120 and Maria purchased \$20,000 worth of bonds. One year later the price index is 126. Maria redeems his bonds for \$22,250 and is in a 40 percent tax bracket. What is Maria's real after-tax rate of interest to the nearest tenth of a percent?

- a. 4.3 percent
- b. 3.1 percent
- c. **1.8 percent**
- d. 1.2 percent

18) Which of the following is not implied by the quantity equation?

- a. If velocity is stable and money is neutral, an increase in the money supply creates a proportional increase in nominal output.
- b. If velocity is stable and money is neutral, an increase in the money supply creates a proportional increase in the price level.
- c. With constant money supply and output, an increase in velocity creates an increase in the price level.
- d. **With constant money supply and velocity, an increase in output creates a proportional increase in the price level.**

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19) If the federal funds rate were above the level the Federal Reserve had targeted, the Fed could move the rate back towards its target by

- a. buying bonds. This buying would reduce reserves.
- b. buying bonds. This buying would increase reserves.**
- c. selling bonds. This selling would reduce reserves.
- d. selling bonds. This selling would increase reserves.

20) In the economy of Ukzten in 2010, exports were \$500, GDP was \$6400, government purchases were \$1500, imports were \$600, and investment was \$2000. What was Ukzten's consumption in 2010?

- a. \$1800
- b. \$2800
- c. \$3000**
- d. \$4000

21) The city of Ann Arbor Michigan buys a police car manufactured in Germany. In the GDP accounts this transaction is included in

- a. in government expenditures and exports.
- b. government expenditures and imports.**
- c. exports, but not government expenditures.
- d. imports, but not government expenditures.

22) If 2002 is the base year, then the inflation rate in 2005 equals

- a. $\frac{\text{CPI in 2005} - \text{CPI in 2004}}{\text{CPI in 2002}} \times 100.$
- b. $\frac{\text{CPI in 2005} - \text{CPI in 2002}}{\text{CPI in 2002}} \times 100.$
- c. $\frac{\text{CPI in 2005} - \text{CPI in 2002}}{\text{CPI in 2004}} \times 100.$
- d. $\frac{\text{CPI in 2005} - \text{CPI in 2004}}{\text{CPI in 2004}} \times 100.$**

23) The price index was 110 in the first year, 100 in the second year, and 96 in the third year. The economy experienced

- a. 9.1 percent deflation between the first and second years, and 4 percent deflation between the second and third years.**
- b. 9.1 percent deflation between the first and second years, and 4.2 percent deflation between the second and third years.
- c. 10 percent deflation between the first and second years, and 4 percent deflation between the second and third years.
- d. 10 percent deflation between the first and second years, and 4.2 percent deflation between the second and third years.

24) Sheri, a U.S. citizen, works only in Germany. The value she adds to production in Germany is included

- a. in both German GDP and U.S. GDP.
- b. in German GDP, but is not included in U.S. GDP.**
- c. in U.S. GDP, but is not included in German GDP.
- d. in neither German GDP nor U.S. GDP.

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25) John buys a used car for \$5,400 and spends \$600 on new parts, made in the U.S., to fix the car. The end result of these two transactions is

- a. U.S. consumption purchases increase by \$5,400 and U.S. GDP increases by \$5,400.
- b. U.S. consumption purchases increase by \$6,000 and U.S. GDP increases by \$6,000.
- c. **U.S. consumption purchases increase by \$600 and U.S. GDP increases by \$600.**
- d. U.S. consumption purchases increase by \$600 and U.S. GDP increases by \$6,000.

26) Suppose that autoworkers are unionized in one region of the country but not in the other. If the unionized workers abolished their unions, most likely employment

- a. and wages of autoworkers in that region would rise.
- b. **of automobile workers in that region would rise, but wages of automobile workers in that region would fall.**
- c. and wages of autoworkers in that region would fall.
- d. of automobile workers in that region would fall but wages of automobile workers in that region would rise.

27) A firm may pay efficiency wages in an attempt to

- a. reduce incentives to shirk.
- b. reduce turnover.
- c. attract a well-qualified pool of applicants.
- d. **All of the above are correct.**

28) Consider five individuals with different occupations.

Allen	prepares taxes	wants ribs
Betty	does dry cleaning	wants computer fixed
Calvin	fixes computers	wants bread
Diedre	bakes bread	wants taxes prepared
Eric	barbecues ribs	wants dry cleaning

In a barter system which of the following pairs has a double coincidence of wants?

- a. Allen and Eric
- b. Diedre and Calvin
- c. Both A and B are correct.
- d. **None of the above are correct.**

29) The banking system currently has \$10 billion of reserves, none of which are excess. People hold only deposits and no currency, and the reserve requirement is 10 percent. If the Fed raises the reserve requirement to 20 percent and at the same time buys \$1 billion worth of bonds, then by how much does the money supply change?

- a. **It falls by \$45 billion.**
- b. It falls by \$52 billion.
- c. It falls by \$55 billion.
- d. None of the above is correct.

30) In the fourteenth century it is estimated that deaths resulting from the bubonic plague reduced the population by about a third. Assuming diminishing returns, the decrease in population should have

- a. **increased productivity and real GDP per person.**
- b. increased productivity but decreased real GDP per person.
- c. increased real GDP per person, but decreased productivity.
- d. decreased productivity and real GDP per person.

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31) ABC Co. sells newly issued bonds. JLG Co. sells newly issued stocks. Which company is raising funds in financial markets?

- a. only ABC
- b. only JLG
- c. **both ABC and JLG**
- d. neither ABC nor JLG

32) Other things the same, if the government increases transfer payments to households, then the effect of this on the government's budget

- a. will make investment rise.
- b. **will make the rate of interest rise.**
- c. will make public saving rise.
- d. All of the above are correct.

33) A government reduces its budget deficit, but at the same time people become concerned that the outlook for future government expenditures and revenues increase the chance it will default. Which of the following is correct.

- a. The reduced budget deficit will raise interest rates in general. The increased risk of default will raise interest rates on government bonds.
- b. The reduced budget deficit will raise interest rates in general. The increased risk of default will reduce interest rates on government bonds.
- c. **The reduced budget deficit will reduce interest rates in general. The increased risk of default will raise interest rates on government bonds.**
- d. The reduced budget deficit will reduce interest rates in general. The increased risk of default will reduce interest rates on government bonds.

34) If people decide to hold more currency relative to deposits, the money supply

- a. falls. The larger the reserve ratio is, the more the money supply falls.
- b. **falls. The larger the reserve ratio is, the less the money supply falls.**
- c. rises. The larger the reserve ratio is, the more the money supply rises.
- d. rises. The larger the reserve ratio is, the less the money supply rises.

35) Which of the following is *not* a reason that paying efficiency wages may increase a firm's profit?

- a. Efficiency wages increase worker health and therefore increase worker productivity.
- b. Efficiency wages decrease worker turnover and therefore decrease hiring and training costs.
- c. Efficiency wages decrease worker shirking and therefore increase worker productivity.
- d. **Efficiency wages decrease a country's natural rate of unemployment and therefore increase its standard of living.**

36) In a closed economy, if Y remained the same, but G rose, T rose by the same amount as G, and C fell but by less than the increase in T, what would happen to private saving and overall national saving?

- a. national saving would fall and private saving would rise
- b. national saving would rise and private saving would fall
- c. **both national saving and private saving would fall**
- d. None of the above is correct.

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37) Workland has a population of 10,000, of whom 7,000 work 8 hours a day to produce a total of 224,000 final goods. Laborland has a population of 5,000, of whom 4,000 work 12 hours a day to produce a total of 120,000 final goods.

- a. Workland has higher productivity and higher real GDP per person than Laborland.
- b. **Workland has higher productivity but lower real GDP per person than Laborland.**
- c. Workland has lower productivity but higher real GDP per person than Laborland.
- d. Workland has lower productivity and lower real GDP per person than Laborland.

38) Which of the following is human capital?

- a. a student loan
- b. **understanding how to use a company's accounting software**
- c. training videos for new corporate employees
- d. All of the above are correct.

39) The steps involved in calculating the consumer price index and the inflation rate, in order, are as follows:

- a. Choose a base year, update the basket, find the prices, estimate the basket's cost, compute the index, and compute the inflation rate.
- b. Choose a base year, fix the basket, find the prices, compute the inflation rate, compute the basket's cost, and compute the index.
- c. **Fix the basket, find the prices, compute the basket's cost, choose a base year and compute the index, and compute the inflation rate.**
- d. Fix the basket, find the prices, compute the inflation rate, compute the basket's cost, and choose a base year and compute the index.

40) In an imaginary economy, consumers buy only razors and cologne. The fixed basket consists of 6 razors and 4 bottles of cologne. A razor cost \$20 in 2009 and \$25 in 2010. A bottle of cologne cost \$30 in 2009 and \$40 in 2010. Using 2009 as the base year, which of the following statements is correct?

- a. For the typical consumer, the number of dollars spent on razors is equal to the number of dollars spent on cologne in each of the two years.
- b. The consumer price index is 310 in 2010.
- c. **The rate of inflation is 29.17% in 2010.**
- d. None of the above is correct.

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WRITE THE LETTER OF YOUR CHOICE FOR THE MULTIPLE CHOICE QUESTIONS HERE;

ONLY THIS PAGE WILL BE GRADED FOR THE MC PART.

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| 1) | 21) |
| 2) | 22) |
| 3) | 23) |
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| 14) | 34) |
| 15) | 35) |
| 16) | 36) |
| 17) | 37) |
| 18) | 38) |
| 19) | 39) |
| 20) | 40) |