Econ 201 Midterm 2 Review

The problems on this page refer to this table and these abbreviations. Consumption = C, Taxes = T, Investment Demand = I_D , Disposable Income = Y-T, Govt. Purchases of Goods and Services = G

Aggregate Expenditure = AE, the MPC is constant, Foreign trade is zero. Autonomous consumption = \$50.

AS = Y	Τ	Y-T	С	I_D	G	AΕ	Δ Inventories
\$2,250	\$250	\$2,000	\$1,850	\$200	\$250	\$2,300	-\$50
\$2,500	\$250	\$2,250	\$2,075	\$200	\$250	\$2,525	-\$25
\$2,750	\$250	\$2,500	\$2,300	\$200	\$250	\$2,750	\$0
\$3,000	\$250	\$2,750	\$2,525	\$200	\$250	\$2,975	\$25
\$3,250	\$250	\$3,000	\$2,750	\$200	\$250	\$3,200	\$50
\$3,500	\$250	\$3,250	\$2,975	\$200	\$250	\$3,425	\$75
\$3,750	\$250	\$3,500	\$3,200	\$200	\$250	\$3,650	\$100

1. (4 points) Fill in the table.

2. (4 points) How big a *change* in Investment Demand would it take to increase the equilibrium by \$750?

(Sign, as in + or -, matters here.)

ANSWER: MPC =
$$\Delta C/\Delta (Y-T) = 225/250 = 0.9$$

$$\Delta AE = $750 = 1/(1-MPC)*\Delta I_D = 10*\Delta I_D$$

$$\Delta I_D = \$750/10 = \$75$$

3. (4 points) How much of a tax *change* would it take to reduce output by \$500? (Sign matters here.)

ANSWER:
$$\Delta AE = -\$500 = -MPC/(1-MPC)*\Delta T = -9*\Delta T$$

$$\Delta T = -\$500/-9 = \$55.56$$

4. (4 points) How much is saving when Y = \$3,750?

ANSWER: Savings =
$$(Y-T) - C = (\$3,750 - \$250) - \$3,200 = \$300$$

5. (4 points) Starting at equilibrium, autonomous consumption rises by \$20, and taxes rise by \$50. What is the new equilibrium level of saving?

ANSWER:

$$S + T + Imports = I_D + G + Exports$$

$$S + $250 + $0 = $200 + $250 + $0$$
 (Originally)
 $S + $250 = 450 (Originally)
 $S = 200 (Originally)

$$S + T + Imports = I_D + G + Exports$$

$$S + \$300 = \$450$$
 (After Δa and ΔT)

$$S = \$450 - \$300 = \$150$$

Or the slow way to do the problem:

What are the effects on equilibrium AE from the change in autonomous consumption and taxes?

 $\Delta AE = 1/(1-MPC)*\Delta a$ = 1/(1-0.9)*(\$20)= +\$200 $\Delta AE = -MPC/(1-MPC)*\Delta T$ = -0.9/(1-0.9)*(+\$50)= -\$450

Net change in equilibrium AE = +\$200 - \$450 = -\$250

New AE = \$2,750 - \$250 = \$2,500

Consumption = a + MPC*(Y-T) = \$70 + 0.9*(\$2,500 - \$300) = \$2,050

Savings = (Y-T) - C = (\$2,500 - \$300) - \$2,050 = \$2,200 - \$2,050 = \$150

10. (4 points) Compute the Overnight Salad Price Index (basically a CPI) for 2022, using 2024 as the base year. Show enough of your work so that we can understand how you got your answer. (Your answer goes at the bottom of the page.)

	P ₂₀₂₂	Q ₂₀₂₂	P ₂₀₂₃	Q ₂₀₂₃	P ₂₀₂₄	Q_{2024}
Lettuce	\$3	4	\$5	6	\$4	6
Mayonnaise	\$8	2	\$7	3	\$6	4
Hotdogs	\$5	10	\$8	8	\$7	12
Rootbeer	\$4	5	\$3	4	\$2	6

ANSWER:

$$CPI_{2022\,with\,2024\,base} = \frac{\vec{P}_{2022} * \vec{Q}_{2024}}{\vec{P}_{2024} * \vec{Q}_{2024}} * 100$$

Comparison year: $P_{2022}*Q_{2024} = \$3*6 + \$8*4 + \$5*12 + \$4*6 = \$18 + \$32 + \$60 + \$24 = \$134$

Base year: $P_{2024} * Q_{2024} = \$4*6 + \$6*4 + \$7*12 + \$2*6 = \$24 + \$24 + \$84 + \$12 = \$144$

Price index for 2022 with 2024 as the base year = 134/144 * 100 = 93.1

11. (4 points) In the previous problem, what is the simple inflation rate from 2022 to 2023, using 2024 as the base year? Show your work and put your answer in the box below.

ANSWER: $P_{2023}*Q_{2024} = \$5*6 + \$7*4 + \$8*12 + \$3*6 = \$30 + \$28 + \$96 + \$18 = \$172$ Inflation rate = (\$172-\$134)/\$134 = 28.4%

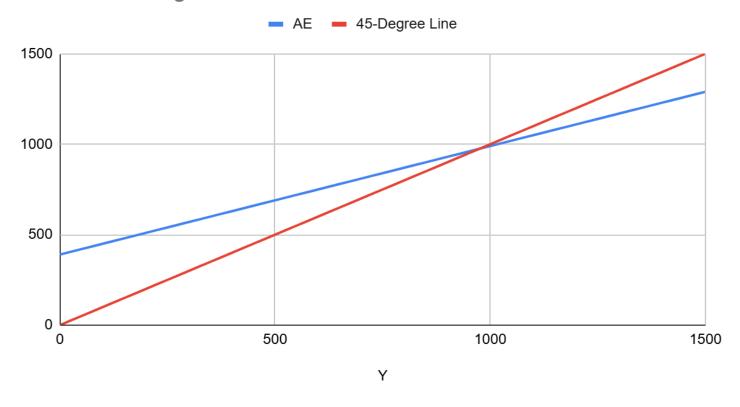
Graphs

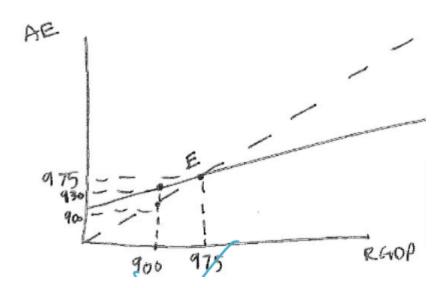
Graph 1: (6 points) $I_D = 250$. MPC = 0.6. Imports = 50. Autonomous consumption = 50. G = 220. Exports = 40. T = 200. On a well-labeled graph of Real Output versus Aggregate Expenditure (45° diagram), clearly show the equilibrium (Mark this point "E"), and what is going on with inventories when Y = 900. (Signs matter!). Explain in words what we expect to happen to the level of output and why.

ANSWER: AE = 50 + 0.6*(Y-200) + 250 + 220 + (40-50) = 390 + 0.6*Y

 $Y^* = 975$. At Y = 900, inventories are falling by 30, causing an increase in production.

AE and 45-Degree Line





We strongly recommend that you try these problems as well!

6. (4 points) What is **equilibrium Aggregate Expenditure** in this economy? Government Spending on Goods & Services is \$600. Taxes are \$500. Autonomous consumption is \$50. Imports are \$400. When RGDP is \$4,000, consumption is \$2,675. A rise in after-tax income of \$500 raises savings by \$125. Investment demand is \$800. Exports are \$500.

Please show enough of your work so that we can understand how you got your answer.

(Please show your work and put your answer below.)

ANSWER: MPC = Δ dC/ Δ (Y-T) = (\$500-\$125)/\$500 = \$375/\$500 = 0.75 AE = \$50 + 0.75*(Y-\$500) + \$800 + \$600 + (\$500 - \$400) = \$1,450 - \$375 + 0.75*Y = \$1,075 + 0.75*Y Y = \$1,175/(1-0.75) = \$4.700

7. (4 points) In the previous problem, what are total leakages when production = \$4,000? What are total injections? (Please show your work and put your answer below.)

ANSWER: Savings =
$$(Y-T)-C = \$4,000 - \$500 - (\$50 + 0.75*(\$4,000-\$500)) = \$3,500 - (\$2,675) = \$825$$

Leakages = $S + T + Imports = \$825 + \$500 + \$400 = \$1,725$
Injections = $I + G + Exports = \$800 + \$600 + \$500 = \$1,900$

8. (4 points) In the previous problem, if we raise exports by \$60, what would this do to equilibrium consumption? (Please show your work and put your answer below.)

ANSWER: $\triangle AE = 1/(1-MPC)*\Delta Exports = 1/(1-0.75)*\$60 = \$240, \Delta C = \Delta AE - \Delta X = 240-60 = 180$

9. (4 points) Everyone has an MPC of 0.85. There are no taxes. Aragorn Elessar, in his role as King of the land of Gondor, hires **Gimli** to build a fast path from Minas Tirith to Edoras, the capital city of the Rohirrim, and pays Gimli 10,000 silver coins for the work. Gimli saves some of this and spends the rest to buy a cream rinse from **Legolas** in the hope of growing a shinier beard. Legolas saves a share of that income against the chance that his movie career fizzles out, and spends the rest to buy paddleboarding lessons from **Katy Perry**. Now that she has this extra income, **how much of it**

does Katy Perry save?

does Katy Terry save.						
Person	Δ (Y-T)	ΔSaving	ΔConsumption			
Gimli	10,000 Castars	1,500 Castars	8,500 Castars			
Legolas	8,500 Castars	1275 Castars	7,225 Castars			
Katy Perry	7,225 Castars	1,083.75 Castars	6,141.25 Castars			

(Castars is not needed for the problem, but it is the currency of Gondor.)