Problem Set #7
PPA897
Professor John McPeak

Name: Key

Due 11/19

1) Social Welfare Functions (SWF)
   a. Identify the outcomes for each policy according to each social welfare function. Identify which is the best policy according to each of the social welfare functions.

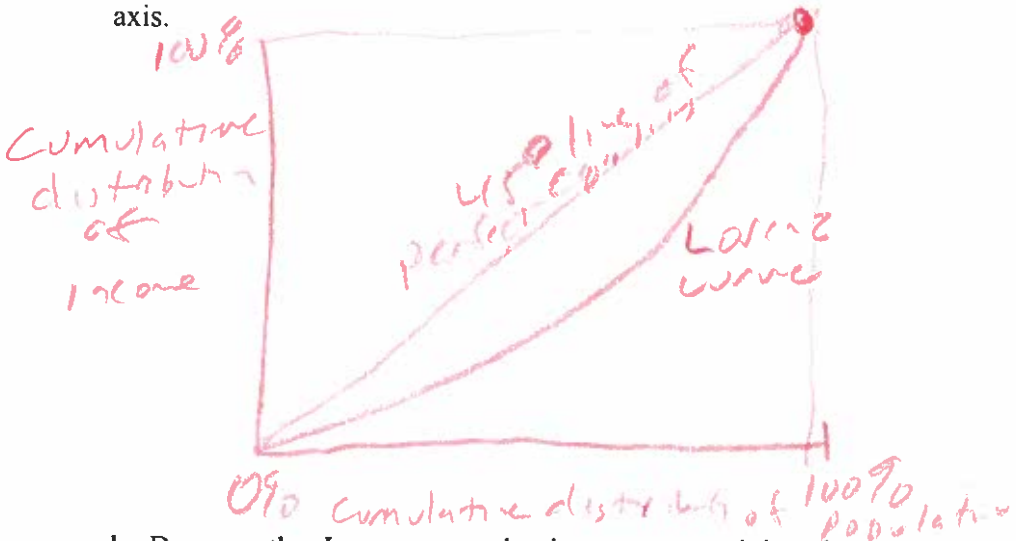
| | Utility person 1 | Utility person 2 | Utility person 3 | | Utilitarian SWF | Rawlsian SWF | Multiplicative SWF / 1000 |
|---|---|---|---|---|---|---|---|
| Policy A | 20 | 80 | 28 | | 128 | 20 | 44.80 |
| Policy B | 39 | 40 | 41 | | 120 | 39 | 63.96 |
| Policy C | 30 | 40 | 65 | | 135 | 30 | 78.00 |
| Policy D | 1 | 100 | 45 | | 146 | 1 | 4.50 |
| Which Policy is best by this SWF? | | | | | D | B | C |

   b. Briefly discuss the different findings by noting what social values are reflected in each measure and how that leads to different evaluations of the best policy according to the different social welfare functions.

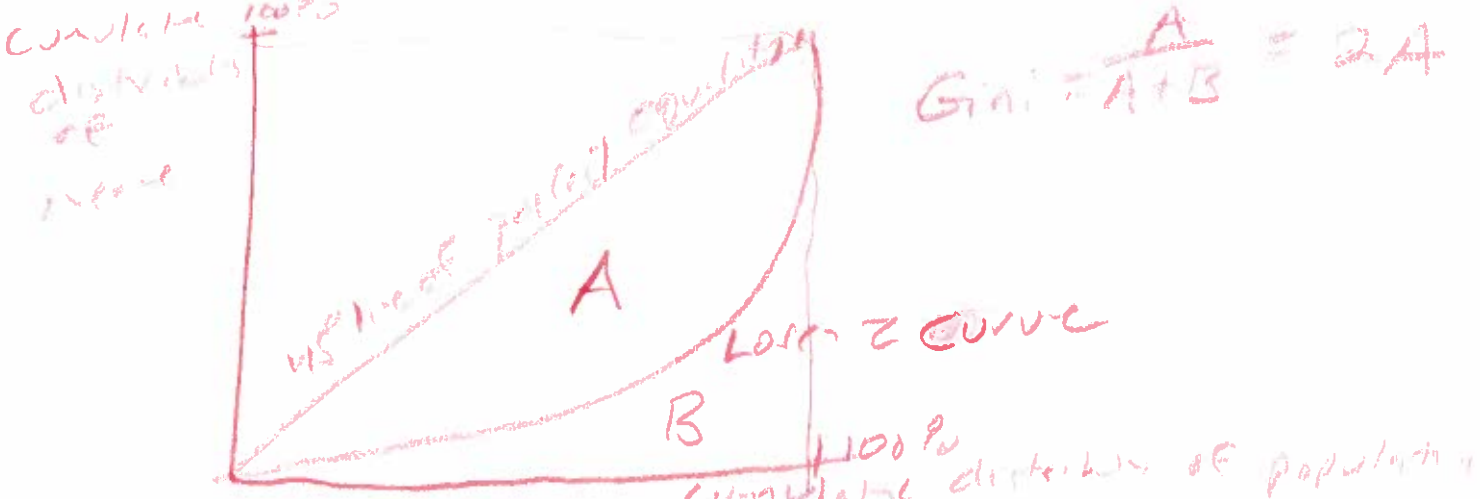
Utilitarian identifies the policy with the maximum total benefit as the best policy. There is not a penalty for inequality of outcomes. Rawlsian is focused on the outcome of the worst off person. It is focused on the outcome for the person who has the lowest outcome. Multiplicative places some weight on the total outcome but also has some penalty for inequality in outcomes.

2) Inequality.

a. Draw and interpret a Lorenz curve. Be clear about what is on the x-axis and what is on the y-axis.




b. Draw another Lorenz curve that is more unequal than the one you drew for part (a). Identify areas A and B that can be used to calculate the Gini coefficient and provide the formula for calculating this coefficient.

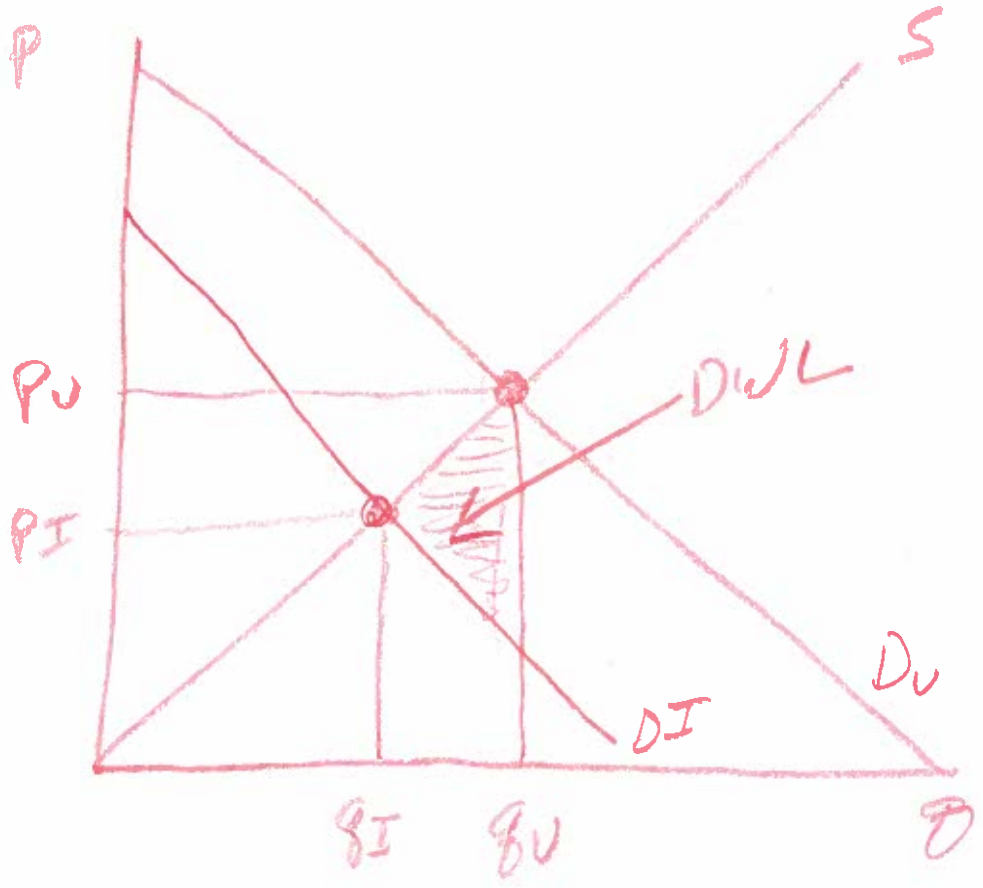



c. What range of values for a Gini coefficient of income distribution is considered relatively equal? What range is considered relatively unequal?

Up to 0.3 is relatively equal

Over 0.5 is relatively unequal

3) Illustrate the deadweight loss of uninformed demand when there is a negative health consequence of consumption of a good that the consumer is not aware of currently.



4) Public goods. There are three people who live in a town. They each have an inverse demand / Marginal Willingness to Pay (MWTP) for the number flowerpots that will be installed around the gazebo in the public park (q is the # of flowerpots). Each person has an inverse demand / MWTP per flowerpot. Anthony's is $MWTP_A$ \$44.00-\$2.00*q. Louise's is $MWTP_L$ =\$22.00-\$2.00*q. Martin's is $MWTP_M$ =\$21.00-\$1.00*q. The marginal cost of flowerpot is constant at \$32.00 per pot.

a. If no effort is made to avoid the free rider problem, what number of pots will be provided and who will provide it?

$MWTP_A = 0$ @ $q = 22$
$MWTP_L = 0$ @ $q = 11$
$MWTP_m = 0$ @ $q = 21$

Only Anthony is willing to provide the good at a cost per unit of \$32.

$44.00 - 2.00q = 32.00$
$12 = 2q$ $q = 6$

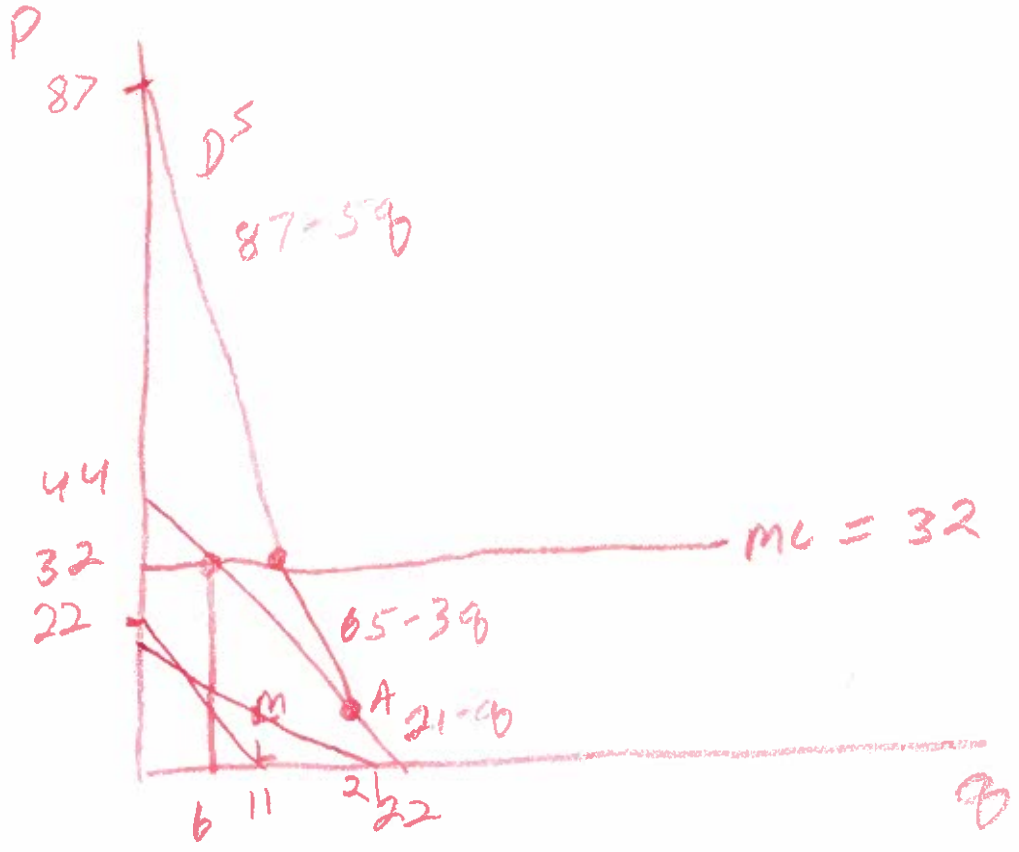
b. How much less is this than the socially optimal number of flowerpots?

$87 - 5q$ $q = 0$ to 11
$65 - 3q$ $q = 11$ to 21
$21 - q$ $q = 21$ to 22
0 for $q = 22$ and greater

$87 - 5q = 32$
$55 = 5q$
$q^{SO} = 11$

$(65 - 3q = 32$
$33 = 3q$
$q^{SO} = 11$

c. Illustrate in a graph the outcomes to a and b.



5) More Public goods: voting.
A community of five people is voting to decide on public good provision this summer in the park. There are three proposals:

Proposal A: Goat Yoga Classes. Total cost is $3,000 ($600 each).

Proposal B: Llama Fashion Shows. Total cost is $5000 ($1,000 each).

Proposal C: Turtle Olympics $7,500 (1,500 each)

600 1000 1500

This table records each household's WTP for each proposal.

| | Proposal A- Goats | Proposal B-Llamas | Proposal C-Turtles |
|---|---|---|---|
| Collins | $800 | $ 800 | $1,400 |
| Murphy | $200 | $2,900 | $1,100 |
| Haberman | $300 | $ 900 | $4,500 |
| Smith | $900 | $1,900 | $1,200 |
| Davidson | $700 | $ 600 | $1,300 |

a) How will they vote for each proposal and which proposal or proposals will pass with a majority? (circle)

| | Proposal A- Goats | | Proposal B-Llamas | | Proposal C-Turtles | |
|---|---|---|---|---|---|---|
| Collins | Yes | No | Yes | No | Yes | No |
| Murphy | Yes | No | Yes | No | Yes | No |
| Haberman | Yes | No | Yes | No | Yes | No |
| Smith | Yes | No | Yes | No | Yes | No |
| Davidson | Yes | No | Yes | No | Yes | No |
| Pass or not? | PASS | | NOT | | NOT | |

b) If we interpret the willingness to pay figures as benefits and the total cost of provision as costs, what is the net value of (benefits – costs) for each proposal?

| Proposal A- Goats | Proposal B – Llamas | Proposal C – Turtles |
|---|---|---|
| 2900 - 3000 = -100 | 7100 - 5000 = 2100 | 9500 - 7500 = 2000 |

c) Did voting lead us to select the proposal that had the highest value of (benefits-costs)? Explain why or why not.

No it did not. Yes-no voting ignores the intensity of preferences.

6) Syracuse University and Crouse Hospital are considering options to deal with the parking issue around campus. SU is considering expanding the University Area Garage by putting in additional levels for parking. Crouse is considering adding additional floors to the Irving Ave garage. The following table sets out the profit per day to each if the following decisions are made

| | | Syracuse University | | | |
|---|---|---|---|---|---|
| | | Expand | | Don't Expand | |
| Crouse Hospital | Expand | 8,000 | 7,000 | 10,500 | 5,600 |
| | Don't Expand | 7,500 | 10,000 | 9,200 | 8,400 |

a) Describe the full set of best response strategies for each player.

If CH expands, SU expand
If CH does not expand, SU expand
If SU expands, CH expand
If SU does not expand, CH expand

b) What is the Nash Equilibrium outcome of this game?

SU expands and gets 7000
CH expands and gets 8000

c) From the point of view of the City of Syracuse and Crouse Hospital, compare the Nash Equilibrium outcome to other outcomes represented in the table using the concepts of Pareto Optimality and Pareto Improving.

Total outcomes are

| CH \ SU | expand | don't expand |
|---|---|---|
| expand | 15,000 | 16,100 |
| don't expand | 17,500 | 17,600 |

The Pareto optimal outcome is ... total payoff is ... for a total of ... Because from the Nash equilibrium ... it is possible ...

7) Circle the correct answer

| Condition A | Condition B | What type of condition is B for establishing A? |
|---|---|---|
| MP is above AP at q | AP is upward sloping at q | N, NS S, NN N,S |
| There are no transaction costs | The market is perfectly competitive | N, NS S, NN N,S |
| The market is perfectly competitive | There are no transaction costs | N, NS S, NN N,S |
| The production function is a short-run production function. | The production function has an input held fixed. | N, NS S, NN N,S |
| A quantity is the profit maximizing quantity | The quantity is produced in an economically efficient way. | N, NS S, NN N,S |
| The last dollar rule is satisfied at a bundle | MRS=MRT at a bundle | N, NS S, NN N,S |
| Average Cost (AC) is greater than Average Variable Cost (AVC) for all values of q. | Average Fixed Cost (AFC) is greater than zero for all values of q. | N, NS S, NN N,S |
| The point defined by the input bundle (K,L) satisfies w*L+r*K=C | The point defined by the input bundle (K,L) lies on the expansion path | N, NS S, NN N,S |

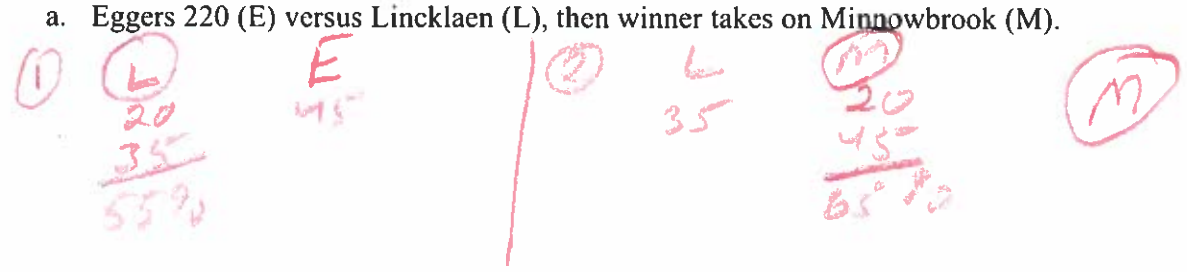
N,NS : Necessary, not sufficient
S, NN: Sufficient, not necessary
N, S: Necessary and sufficient.

8) The faculty of the PAIA department are planning on a meeting to discuss and revise the EMPA curriculum. The options for the meeting are: three days at Minnowbrook in the Adirondacks (M); one day at the Lincklaen House in Cazenovia (L); and 2-hours in Eggers 220 (E). There are three groups in the faculty: those who think the curriculum needs serious revision that needs a 3-day meeting to fix (M); those who think the curriculum needs some revision and a 1-day meeting should take care of it (L); and those who think the curriculum needs minor revision and a 2-hour meeting should cover it (E). Those who think it needs minor revision also like hiking in the Adirondacks so prefer Minnowbrook to Lincklaen so they could hike after a short meeting. The following table describes the groups in the faculty and their preferences over the retreat options.

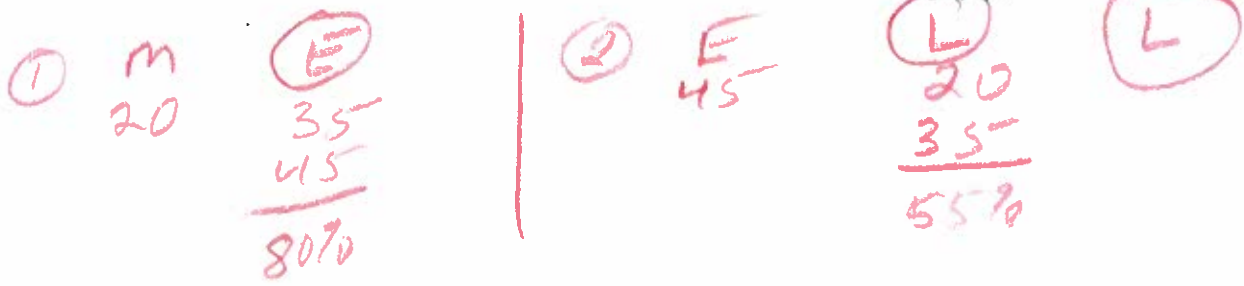
| Preferences over retreat options | | | | |
|---|---|---|---|---|
| Group believes curriculum | First Choice | Second Choice | Third Choice | Percent of the faculty |
| Need serious revision | Minnowbrook | Lincklaen | Eggers 220 | 20% |
| Needs some revision | Lincklaen | Eggers 220 | Minnowbrook | 35% |
| Needs minor revision | Eggers 220 | Minnowbrook | Lincklaen | 45% |

For each agenda, describe the voting in each round and the final outcome.

a. Eggers 220 (E) versus Lincklaen (L), then winner takes on Minnowbrook (M).




b. Minnowbrook (M) versus Eggers 220 (E), winner takes on Lincklaen (L).




c. Lincklaen (L) versus Minnowbrook (M), winner takes on Eggers 220 (E).