# Comparative Advantage Practice Problems Solutions

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ECON 324 Fall 2018

For each of the following problems, answer (a) what is the equation of the PPF (expressed with the first good on the horizontal axis and the second good on the vertical axis) for each person? (b) what are each person's opportunity costs? (c) who should specialize in producing what? (d) what will the range of prices be for each good?

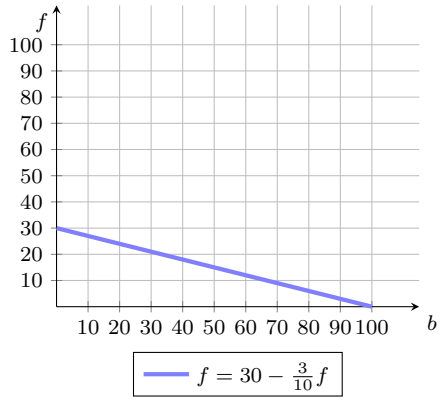
1. Bob and Ann can each gather bananas and/or fish. If Bob spends all of his time, he can collect 100 bananas or 30 fish. If Ann spends all of her time, she can collect 60 bananas or 30 fish. Currently, Bob is collecting 50 bananas and 15 fish; Ann is collecting 30 bananas and 15 fish.

**Solution:** If they both spent all of their resources on producing each good, they could achieve a maximum as follows:

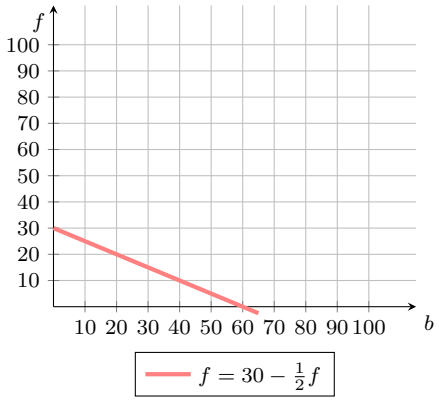
| | Bananas | Fish |
|---|---|---|
| Bob | 100 | 30 |
| Ann | 60 | 30 |

By just graphing the two endpoints, we can construct the PPFs:

Bob




Ann




The slope of each PPF is each person's opportunity cost of the horizontal good. The inverse of the slope is each person's opportunity cost of the vertical good:

| | 1 Banana | 1 Fish |
|---|---|---|
| Bob | $\frac{3}{10}$f | $3\frac{1}{3}$b |
| Ann | $\frac{1}{2}$f | 2b |

Thus, Bob has a lower opportunity cost in producing Bananas, and Ann has a lower opportunity cost in producing Fish. Bob should specialize in producing Bananas, and Ann in producing Fish.

The price paid for Bananas will be between $\frac{3}{10}$ and $\frac{1}{2}$ Fish. Likewise for Fish, it will be between 2 and $3\frac{1}{3}$ Bananas.

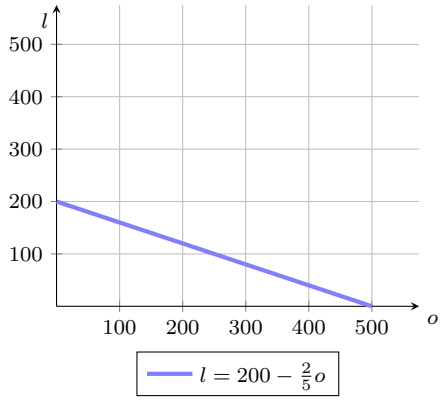
2. Gondor and Rohan can each produce oil and linen. If Gondor devotes all of its resources, it can produce 500 barrels of oil or 200 units of linen. If Rohan devotes all of its resources, it can produce 300 barrels or oil or 100 units of linen. Currently, Gondor is producing 250 barrels of oil and 100 units of linen; Rohan is producing 150 barrels of oil and 50 units of linen.

**Solution:** If they both spent all of their resources on producing each good, they could achieve a maximum as follows:

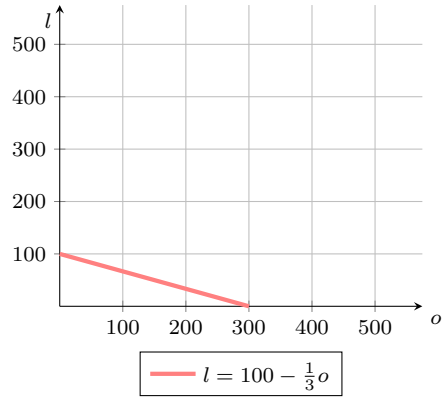
| | Oil | Linen |
|---|---|---|
| Gondor | 500 | 200 |
| Rohan | 300 | 100 |

By just graphing the two endpoints, we can construct the PPFs:

Gondor




Rohan




The slope of each PPF is each person's opportunity cost of the horizontal good. The inverse of the slope is each person's opportunity cost of the vertical good:

| | 1 Oil | 1 Linen |
|---|---|---|
| Gondor | 0.4l | 2.5o |
| Rohan | $\frac{1}{3}$l | 3o |

Thus, Gondor has a lower opportunity cost in producing Linen, and Rohan has a lower opportunity cost in producing Oil. Gondor should specialize in producing Linen, and Rohan in producing Oil.

The price paid for Oil will be between $\frac{1}{3}$ and 0.4 Linens. Likewise for Linen, it will be between 2.5 and 3 barrels of Oil.

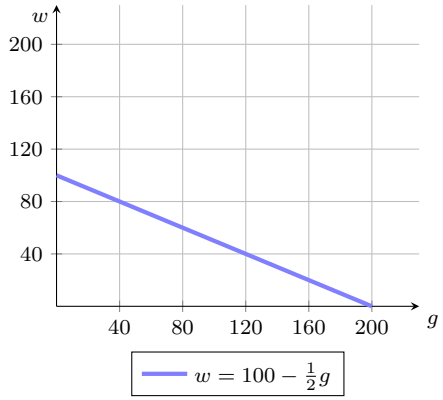
3. Casterly Rock and Highgarden can each produce gold and wheat. If Casterly Rock devotes all of its resources, it can produce 200 ounces of gold or 100 bushels of wheat. If Highgarden devotes all of its resources, it can produce 120 ounces of gold or 80 bushels of wheat. Currently, Casterly Rock is producing 100 gold and 50 wheat; Highgarden is producing 60 gold and 40 wheat.

**Solution:** If they both spent all of their resources on producing each good, they could achieve a maximum as follows:

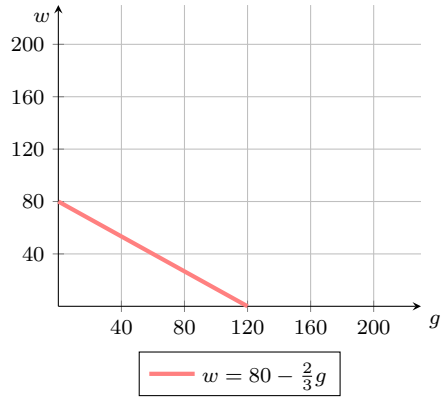
| | Gold | Wheat |
|---|---|---|
| Casterly Rock | 200 | 100 |
| Highgarden | 120 | 80 |

By just graphing the two endpoints, we can construct the PPFs:

Casterly Rock




Highgarden




The slope of each PPF is each person's opportunity cost of the horizontal good. The inverse of the slope is each person's opportunity cost of the vertical good:

| | 1 Gold | 1 Wheat |
|---|---|---|
| Casterly Rock | $\frac{1}{2}$w | 2g |
| Highgarden | $\frac{2}{3}$w | 1.5g |

Thus, Casterly Rock has a lower opportunity cost in producing Gold, and Highgarden has a lower opportunity cost in producing Wheat.

The price paid for Gold will be between $\frac{1}{2}$ and $\frac{2}{3}$ Wheat. Likewise for Wheat, it will be between 1.5 and 2 Gold.

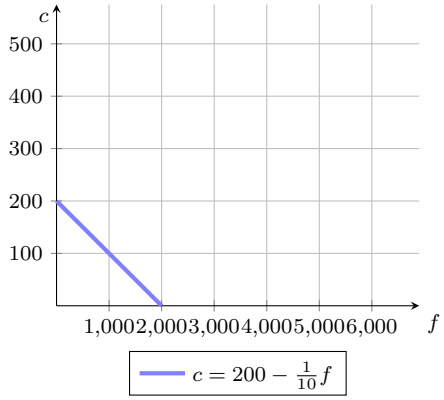
4. Japan and Ireland can each produce fish and cars. If Japan devotes all of its resources, it can produce 2,000 fish or 200 cars. If Ireland devotes all of its resources, it can produce 6,000 fish or 300 cars. Japan is currently producing 1000 fish and 100 cars; Ireland is currently producing 2000 fish and 200 cars.

**Solution:** If they both spent all of their resources on producing each good, they could achieve a maximum as follows:

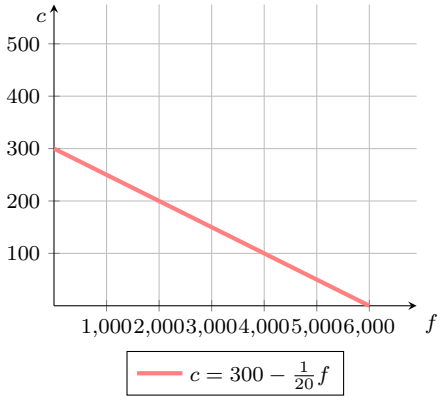
| | Fish | Cars |
|---|---|---|
| Japan | 2,000 | 200 |
| Ireland | 6,000 | 300 |

By just graphing the two endpoints, we can construct the PPFs:

Japan




Ireland




The slope of each PPF is each person's opportunity cost of the horizontal good. The inverse of the slope is each person's opportunity cost of the vertical good:

| | 1 Fish | 1 Car |
|---|---|---|
| Japan | 0.1c | 10f |
| Ireland | 0.05c | 20f |

Thus, Japan has a lower opportunity cost in producing Cars, and Ireland has a lower opportunity cost in producing Fish. Japan should specialize in producing Cars, and Ireland in producing Fish.

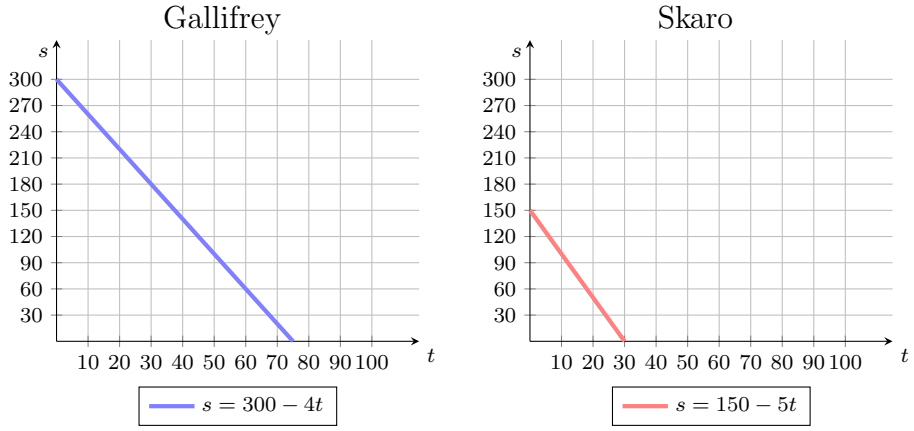
The price paid for Fish will be between 0.05 and 0.1 Cars. Likewise for Cars, it will be between 10 and 20 Fish.

5. The planet Gallifrey and the planet Skaro can each produce Tardises and sonic screwdrivers. If Gallifrey devotes all of its resources, it can produce 75 Tardises, or 300 sonic screwdrivers. If Skaro devotes all of its resources, it can produce 30 Tardises or 150 sonic screwdrivers. Gallifrey is currently producing 50 Tardises and 100 Sonic Screwdrivers; Skaro is currently producing 20 Tardises and 50 Sonic Screwdrivers.

**Solution:** If they both spent all of their resources on producing each good, they could achieve a maximum as follows:

| | Tardises | Sonic Screwdrivers |
|---|---|---|
| Gallifrey | 75 | 300 |
| Skaro | 30 | 150 |

By just graphing the two endpoints, we can construct the PPFs:




The slope of each PPF is each person's opportunity cost of the horizontal good. The inverse of the slope is each person's opportunity cost of the vertical good:

| | 1 Tardise | 1 Sonic Screwdriver |
|---|---|---|
| Gallifrey | 4s | 0.25t |
| Skaro | 5s | 0.2t |

Thus, Gallifrey has a lower opportunity cost in producing Tardises, and Skaro has a lower opportunity cost in producing Sonic Screwdrivers. Gallifrey should specialize in producing Tardises, and Skaro in producing Sonic Screwdrivers.

The price paid for Tardises will be between 4 and 5 Sonic Screwdrivers. Likewise for Sonic Screwdrivers, it will be between 0.2 and 0.25 Tardises.