

Answers to Homework # 1

1) Shopping carts are about 50 percent larger today than they were 30 years ago. Give an economic explanation for this.

The opportunity cost of shoppers' time has increased with the increase in incomes and two-wage earner families. The larger carts enable people to make fewer shopping trips and economize on their time.

2) A university produces two commodities: research and teaching. The resources the university uses include faculty and staff, libraries, classrooms, and so on. The following schedule indicates some points on the university's PPF:

	A	B	C	D	E	F	G
Research	900	750	600	450	300	150	0
Teaching	0	60	110	150	180	200	210

a. Does research production by the university exhibit increasing, constant, or decreasing per-unit opportunity costs? How does this affect the shape of the university's PPF?

The research production in the university exhibits *increasing* opportunity costs because for each additional 150 unit increase in research production, more and more teaching is given up. For example, at point G, 150 units of additional research costs only 10 teaching units. Whereas, at point B, 150 units of additional research costs 60 teaching units. The university's PPF has a *concave* shape.

b. Graph the university's PPF (assuming that straight-line segments connect the points specified above). Indicate which areas of the graph correspond to unattainable production points; production points that make the most of the university's resources; and points where there are under-used resources.

The area inside (and along) the PPF is attainable, while the area outside the boundary of the PPF is unattainable with the university's current resources. Production points that lie on the boundary of the PPF use the university's resources most effectively. And the points inside the PPF show production points where resources are wasted or under-used.

c. Suppose that the university is at point B but would like to alter production to point C. What would be the *per-teaching-unit* opportunity cost of producing the extra teaching units?

The opportunity cost of producing the additional 50 teaching units is 150 units of research. Thus, each teaching unit costs 3 research units.

d. Suppose that the university is at point C but would like to alter production to point B. What would be the *per-research-unit* opportunity cost of producing the extra research units?

The opportunity cost of producing the additional 150 units of research is 50 units of teaching. Thus, each research unit costs $\frac{1}{3}$ teaching units.

e. What will happen to the university's PPF if the main library doubled its subscriptions to academic journals (assume the journals are not used to produce teaching but are used solely to produce research)? Graph the new PPF.

If the main library doubles its journals subscriptions, the PPF will shift out toward the axis where research is plotted.

f. What will happen to the PPF if all of the campus resources are doubled? Graph the new PPF.

The entire PPF would shift outward because more resources mean more research and more teaching is produced.

g. Suppose the university is at point F. The university president proposes to move the school to point B. She claims that B is a more desirable choice since the total output is 810 units (i.e., $750 + 60$) at point B versus 350 (i.e., $150 + 200$) units of total output at point F. Is the president correct? Why or why not?

No, the president is being silly. All points on the boundary of the PPF represent efficient use of the university's resources. The university should move to point B only if the increased research brings more money, more students, or better faculty to the university.