For all , and all ,

## Exercise for home:

Let a collection of commodities vectors be given as:

You can view commodities as food, clothing, entertainment etc. Each will have multiple elements, for instance food may contain dairy, candy, fresh fruits, and so on. We can call an element of this set as a “bundle.”

1. One feature of this consumption set is that it is convex. Define this convex set.

Denote and as two elements in the set. Then let such that is also an element of the set.

2. Let price be and wealth be . Then a person’s budget is given by .

Let the budget set be defined as: . Show that this budget set is convex. (*Hint: use the fact that you know that the consumption set is convex to begin with*).

Let and be two elements in the set. Since the consumption set is convex, then evidently . What do you want to show? , ie:

Going back to our definition:

and . Further,

and (just multiplying with the relevant scalars)

Putting these two together:

Since , this budget set is convex!