Chapter 16 Homework

1.   1.Farmer Jones wishes to know what type of tractor to purchase among a choice of small and large tractors. Suppose he has 700 acres, works 40 hours/week during planting season (3 weeks long), and plants at 7 acres/hr. with the small tractor and 9 acres/hr. with the large. Yields are as follows:

		Corn	Soybeans
	1	150	35
Planting Week	2	140	40
	3	120	41

The corn price is $2.50, the soybean price is $6.00. The larger tractor costs $15,000 and the small tractor costs $12,000. Either tractor lasts 5 years and wears out an equal amount each year.

Formulate an integer program of this.

2.Suppose a firm is deciding how much to purchase X_s and resell X_d of the same good subject to the following:

Demand Price   = 4 - .6X_d

Marginal Cost   = 3 - .5X_s

Formulate the model explicitly including the downward sloping cost function.

 3.Discuss how you would include constraints in a farm model to indicate that only four or six row equipment be purchased.

4.   Suppose Ready Pack containers is trying to determine which consignment items to accept for shipping. Ready Pack has 10,000 cu. ft. of shipping space and can choose among the following 12 items:

Item	Shipping fee collected	cu.. ft. used
1	700	700
2	1700	1500
3	1200	900
4	1500	1200
5	3500	2600
6	4000	3000
7	350	300
8	400	400
9	710	700
10	900	1100
11	5700	4200
12	1300	1200

Set up a model to maximize shipping fees subject to the restriction that you must take the whole item or nothing.

5. Set up a GAMS formulation with integer investment variables of your earlier model