

**Problem 1**

The Onenote Co. produces a single product at three plants for four customers. The three plants will produce 60, 80, and 40 units, respectively, during the next time period. The firm has made a commitment to sell 40 units to customer 1, 60 units to customer 2, and at least 20 units to customer 3. Both customers 3 and 4 also want to buy as many of the remaining units as possible. The net profit associated with shipping a unit from plant  $i$  for sale to customer  $j$  is given by the following table:

	Customer 1	Customer 2	Customer 3	Customer 4
Plant 1	800	700	500	200
Plant 2	500	200	100	300
Plant 3	600	400	300	500

Management wishes to know how many units to sell to customers 3 and 4 and how many units to ship from each of the plants to each of the customers to maximize profit.

Provide the formulation and solution (via Excel or CPLEX).

Source: Hillier & Lieberman 8.1.6

**Problem 2**

A contractor, Susan Meyer, has to haul gravel to three building sites. She can purchase as much as 18 tons at a gravel pit in the north of the city and 14 tons at one in the south. She needs 10, 5, and 10 tons at sites 1, 2, and 3, respectively. The purchase price per ton at each gravel pit and the hauling cost per ton are given in the table below.

	Hauling Cost Per Ton			Price per Ton
	Site 1	Site 2	Site 3	
North Pit	800	700	500	300
South Pit	500	200	100	420

Susan wishes to determine how much to haul from each pit to each site to minimize the total cost for purchasing and hauling gravel.

Provide the formulation and solution (via Excel or CPLEX).

Source: Hillier & Lieberman 8.2.21

**Problem 3**

The Jamieson Clan is heading to Disney World (as I've mentioned in class before) next year. What I've not mentioned is that we're heading to Disney World *twice* next year. We are in process of trying to figure out whether or not to purchase an Annual Pass, instead of two sets of Park-Hopper passes.

(a) Using data found here: <http://disneyworld.disney.go.com/tickets-passes/>, determine the maximum number of days (summed across the two visits) before purchasing an Annual Pass makes sense. Keep in mind that the two visits are completely separate and that they will be tickets with Park Hopper.

(b) How many Mickey Mouse head shaped ice cream bars should we let Amelia eat? How about churros?

Source: Been doing a lot of trip planning recently.