

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

A candy merchant sells two variety bags of candy. Each pound of variety bag A contains 60% caramels and 40% chocolates and sells for \$8 a pound. Each pound of variety bag B contains 45% caramels and 55% chocolates and sells for \$10 a pound. The merchant has available 400 pounds of caramels and 300 pounds of chocolate. The merchant will try to sell the amount of each blend that maximizes her income. Let  $x$  be the number of pounds of variety bag A and  $y$  be the number of pounds of variety bag B.

1) Since the merchant above has available 300 pounds of chocolates, one inequality that must be satisfied is in the situation above is

2) In the situation above, the objective function is

Solve the problem.

3) Two kinds of crated cargo, A and B, are to be shipped by truck. Each crate of cargo A is 50 cubic feet in volume and weighs 200 pounds, whereas each crate of cargo B is 10 cubic feet volume and weighs 360 pounds. The shipping company charges \$75 per crate for cargo A and \$100 per crate for cargo B. The truck has a maximum load limit of 7,200 pounds and 1,000 cubic feet.

(a) Fill in the chart below.

	A	B	Truck I
Volume			
Weight			
Charge			

(b) Let  $x$  be the number of crates of cargo A and  $y$  the number of crates of cargo B shipped by one truck. Using the chart in (a), give two inequalities that  $x$  and  $y$  must satisfy because of the truck's load limits.

(c) Give the inequalities that  $x$  and  $y$  must satisfy because they cannot be negative.

(d) Give an expression for the total charges from shipping  $x$  crates of cargo A and  $y$  crates of cargo B.

(e) Graph the feasible set of this problem.

4) A furniture-finishing plant finishes two kinds of tables—A and B. Table A requires 8 minutes of staining and 10 minutes of varnishing, whereas table B requires 12 minutes of staining and 9 minutes of varnishing. The staining facility is available at most 480 minutes per day and the varnishing facility is available at most 450 minutes per day. The profit is \$5 on each A-table and \$3 on each B-table.

(a) Fill in the chart:

	A	B	Available T
Staining			
Varnishing			
Profit			

(b) Let  $x$  be the number of A-tables and  $y$  the number of B-tables finished per day. Give all the inequalities that  $x$  and  $y$  must satisfy.

(c) Express the total daily profit as a linear function of  $x$  and  $y$ .

(d) Graph the feasible set for this problem.

5) A television manufacturing company has two factories—I and II—that manufacture color and monochrome TV sets. Each day, factory I produces 50 color and 20 monochrome TV sets at a cost of \$3,000. Each day, factory II produces 30 color and 24 monochrome TV sets at a cost of \$2,700. An order is received for 2700 color and 1800 monochrome TV sets.

(a) Let  $x$  and  $y$  represent the number of days factory I and factory II must operate, respectively, to fill the order. Give all constraints on  $x$  and  $y$  in the form of linear inequalities.

(b) Write the total daily operating cost as a function of  $x$  and  $y$ .

(c) Graph the feasible set for this problem.