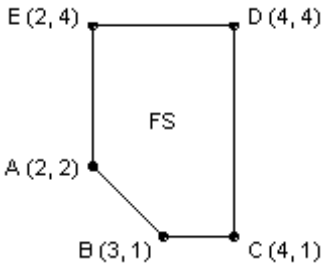
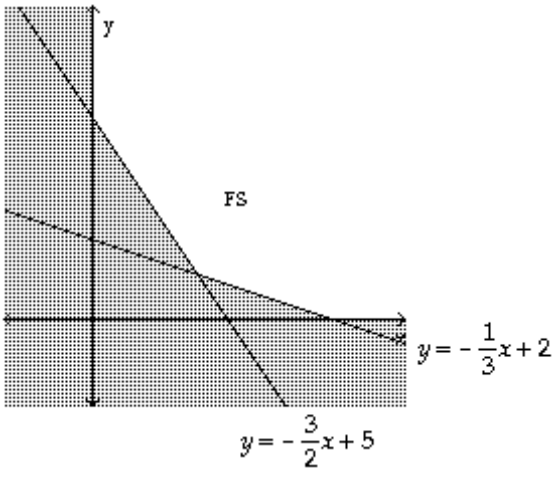
SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

1) Consider the feasible set (FS) below of a certain linear programming problem.



What is the maximum value of the objective function 5x - y?

2) For the feasible set (FS) below, find the coordinates of the point that minimizes 4x + 5y. Find the minimum value of 4x + 5y.



3) Maximize the objective function 3x + y subject to the following constraints. Solve graphically.

$$\begin{cases} 2x + y \le 25 \\ x + y \le 20 \\ x \le 12 \\ x \ge 0, y \ge 0 \end{cases}$$

4) Minimize the objective function 3x + 2y subject to the following constraints. Solve graphically.

$$\begin{cases} 2x + y \ge 30 \\ 2x + 5y \ge 50 \\ x + y \ge 20 \\ x \ge 0, y \ge 0 \end{cases}$$

Solve the problem.

5) 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 in 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 7200 pounds and 1000 cubic feet. How many crates of each cargo should be shipped on each truck in order to satisfy the load limits and yield the greatest charges? Compute the corresponding charge.

6) A furniture-finishing plant finishes two kinds of tables, A and B. Table A requires 8 minutes of staining and 9 minutes of varnishing, whereas table B requires 12 minutes of staining and 6 minutes of varnishing. The staining facility is available at most 480 minutes per day and the varnishing facility is available at most 360 minutes per day. The plant has to finish at least as many B-tables as half the number of A-tables finished. The profit is $5 on each A-table and $3 on each B-table.

(a) 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.
(b) Graph the feasible set for this problem.
(c) Find the values of x and y that maximize the profit, and the corresponding profit.