[12] **1.** Study the following problem.

$$\begin{aligned}
\text{maximize} \quad & f = 5x_1 + x_2 - x_3 \\
\text{subject to} \quad & 3x_1 + x_2 - x_3 \le -2 \\
& 3x_1 - x_2 - 2x_3 \le -3 \\
& x_1 \qquad\qquad \le 2 \\
& x_1, x_2, x_3 \ge 0
\end{aligned}$$

(a) By comparing the objective function and the constraints, or otherwise, show that this problem cannot be unbounded.   [2 marks]

(b) Find a basic feasible solution.   [5 marks]

(c) Find all optimal solutions.   [5 marks]