

Show all work and circle/box your final answer. All answers must be simplified unless stated otherwise.

Note: These are problems 1-4 in section 7.4 of the textbook. This classwork is the entire homework 14.

(1) Minimize $x^2 + 3y^2 + 10$ subject to the constraint $8 - x - y = 0$.

(2) Maximize $x^2 - y^2$ subject to the constraint $2x + y - 3 = 0$

(3) Maximize $x^2 + xy - 3y^2$ subject to the constraint $2 - x - 2y = 0$.

(4) Minimize $\frac{1}{2}x^2 - 3xy + y^2 + \frac{1}{2}$ subject to the constraint $3x - y - 1 = 0$