Use Lagrange multipliers to find any extrema.

1) Maximize \( F(x, y) = xy \)  Subject to \( x + y = 10 \)

2) Minimize \( F(x, y) = x^2 + y^2 \)  Subject to \( x + y - 2 = 2 \)

3) Maximize \( F(x, y) = 2x + 2xy + y - 4 \)  Subject to \( 2x + y = 100 \)

Answers (Revision 2)

1) Maximum of 25 occurs at (5, 5)

2) Minimum of 8 occurs at (2, 2)

3) Maximum of 2596 occurs at (25, 50)