Interior Point Algorithm: Example 3

For the problem,

$$\begin{aligned} \min \quad & f = y^2 \\ & 2y \leq 9 \\ & y \geq 0 \end{aligned}$$

Transform the inequality constraint $2y \leq 9$ into an equivalent equality constraint with a slack variable. Starting at the point $y = 3$, Lagrange multiplier $\lambda = 1$, and barrier parameter $\mu = 10$, take one step by solving the barrier problem of the interior point algorithm. Use a step size of $\alpha = 0.5$.