Exercise 3:
Convex function optimization

$f(\boldsymbol{x}) = 2x_1^2 + x_1x_2 + x_2^2 - 5x_1 - 3x_2 + 4$ $f(\boldsymbol{x})$ is convex

1. f の勾配 ∇f を求めよ
2. $(0,0), (1,2), (1,0.5), (1,1)$ における f の勾配を求めよ
3. f を最小にする $\boldsymbol{x}$ とその時の $f(\boldsymbol{x})$ を求めよ

1. Find the gradient ∇f of f
2. Find the gradient of f at (0, 0), (1, 2), (1, 0.5), (1, 1)
3. Find $\boldsymbol{x}$ that minimizes f and $f(\boldsymbol{x})$ at that time