$$E(x_i - x_j)^2 = E(x_i^2 - 2x_i x_j + x_j^2)$$

$$= E(x_i^2) - 2E(x_i x_j) + E(x_j^2)$$

$$= 2E(x^2) - 2E(x_i x_j)$$

$$= 2(Var_x + \bar{x}^2) - 2(Cov(x_i x_j) + \bar{x}^2)$$

$$= 2(Var_x - Cov(x_i x_j))$$