1. For $g(x, y) = \frac{1}{2}x^T Px + q^T x + y^T (Ax - b)$, where $x \in \mathbb{R}^N$ and $y \in \mathbb{R}^M$ what is $\nabla_x g(x, y)$?
   (a) $\nabla_x g(x, y) = q + Ax$
   (b) $\nabla_x g(x, y) = Px + q + A^T y$
   (c) $\nabla_x g(x, y) = q + A^T y$
   (d) $\nabla_x g(x, y) = (P - A)x$
2. For $g(x, y) = \frac{1}{2}x^T Px + q^T x + (Ax - b)^T y$, where $x \in \mathbb{R}^N$ and $y \in \mathbb{R}^M$ what is $\nabla_x g(x, y)$?
   (a) $\nabla_x g(x, y) = q + Ax$
   (b) $\nabla_x g(x, y) = Px + q + A^T y$
   (c) $\nabla_x g(x, y) = q + A^T y$
   (d) $\nabla_x g(x, y) = (P - A)x$
3. For $g(x, y) = \frac{1}{2}x^T Px + q^T x + (Ax - b)^T y$, where $x \in \mathbb{R}^N$ and $y \in \mathbb{R}^M$ what is $\nabla_y g(x, y)$?
   (a) $\nabla_y g(x, y) = A^T x$
   (b) $\nabla_y g(x, y) = Ax - b$
4. For $g(x, y) = \frac{1}{2}x^T Px + q^T x + y^T (Ax - b)$, where $x \in \mathbb{R}^N$ and $y \in \mathbb{R}^M$ what is $\nabla_y g(x, y)$?
   (a) $\nabla_y g(x, y) = A^T x$
   (b) $\nabla_y g(x, y) = Ax - b$
5. For $J(x) = (x - x_{ref})^T Q(x - x_{ref})$, what is $\nabla_x J(x)$?
   (a) $\nabla_x J(x) = Qx - Qx_{ref}$
   (b) $\nabla_x J(x) = 2Q(x - x_{ref})$
   (c) $\nabla_x J(x) = Q(x - x_{ref})$
6. Both iLQR and DDP solve the same class of trajectory optimization problem.
   (a) true
   (b) false
7. DDP is simply the Gauss-Newton version of iLQR (which is full Newton).
   (a) true
   (b) false
8. With infinite precision, iLQR with a quadratic cost function and nonlinear dynamics would not need regularization during the backwards pass to ensure positive semi-definiteness of the cost-to-go hessian P.
   (a) true
   (b) false
9. With infinite precision, DDP with a quadratic cost function and nonlinear dynamics would not need regularization during the backwards pass to ensure positive semi-definiteness of the cost-to-go hessian P.
   (a) true
   (b) false
10. In iLQR/DDP, you can initialize the solver with a dynamically infeasible initial guess.
    (a) true
    (b) false