

Name: _____

10. (5 points) Mark each of the following statements as true or false, and provide a correct – and brief – explanation for the validity of each of your answers:

- (a) The purpose of `step_size_fn` is to allow step sizes to increase with iteration index `k`, so that `sgd` and `gd` can converge faster.

☐ True ☐ False

Explanation:

- (b) If $\theta = \text{th0}$ were luckily at a local **minimum** of the objective function, then the output of gradient descent `gd` would always be θ , independent of `num_steps`.

☐ True ☐ False

Explanation:

- (c) If $\theta = \text{th0}$ were luckily at a local **maximum** of the objective function, then the output of gradient descent `gd` would always be θ , independent of `num_steps`.

☐ True ☐ False

Explanation:

- (d) If $\theta = \text{th0}$ were luckily at a local **minimum** of the objective function, then the output of stochastic gradient descent `sgd` would always be θ , independent of `num_steps`.

☐ True ☐ False

Explanation:

- (e) The gradient produced by `dJ` is a d -dimensional vector which points in the direction which maximizes the objective function.

☐ True ☐ False

Explanation: