

1. What is the name for a function that is used to optimize another function subject to constraints?
 - A. A Lagrange multiplier
 - B. A constrained optimization function
 - C. A function of several variables
 - D. A function of one variable
2. What does the Lagrange multiplier represent in a constrained optimization problem?
 - A. The amount by which the function to be optimized must be changed in order to satisfy the constraints
 - B. The amount by which the constraints must be changed in order to satisfy the function to be optimized
 - C. The amount by which the function to be optimized must be changed in order to satisfy the objective function
 - D. The amount by which the objective function must be changed in order to satisfy the constraints
3. In the two-variable case, what is the name for the curve on which the Lagrange multiplier must lie?
 - A. The feasible set
 - B. The gradient vector
 - C. The Hessian matrix
 - D. The Lagrangian
4. What is the first-order necessary condition for a local extremum of a function of several variables?
 - A. The function must be continuous at the extremum point.
 - B. The function must be differentiable at the extremum point.
 - C. The gradient vector of the function must be zero at the extremum point.
 - D. The Hessian matrix of the function must be positive definite at the extremum point.
5. What is the second-order necessary condition for a local minimum of a function of several variables?
 - A. The function must be continuous at the extremum point.
 - B. The function must be differentiable at the extremum point.
 - C. The gradient vector of the function must be zero at the extremum point.
 - D. The Hessian matrix of the function must be positive definite at the extremum point.
6. What is the second-order necessary condition for a local maximum of a function of several variables?
 - A. The function must be continuous at the extremum point.
 - B. The function must be differentiable at the extremum point.
 - C. The gradient vector of the function must be zero at the extremum point.
 - D. The Hessian matrix of the function must be negative definite at the extremum point.
7. What is the second-order sufficient condition for a local minimum of a function of several variables?
 - A. The function must be continuous at the extremum point.

- B. The function must be differentiable at the extremum point.
- C. The gradient vector of the function must be zero at the extremum point.
- D. The Hessian matrix of the function must be positive definite at the extremum point.

8. What is the second-order sufficient condition for a local maximum of a function of several variables?

- A. The function must be continuous at the extremum point.
- B. The function must be differentiable at the extremum point.
- C. The gradient vector of the function must be zero at the extremum point.
- D. The Hessian matrix of the function must be negative definite at the extremum point.

9. What is the name for the function that is optimized in a constrained optimization problem?

- A. The objective function
- B. The constraint function
- C. The Lagrange multiplier
- D. The extremum point

10. What is the name for the set of points at which the objective function and the constraint function are equal?

- A. The feasible set
- B. The gradient vector
- C. The Hessian matrix
- D. The Lagrangian

Answer Key: 1-A, 2-A, 3-D, 4-C, 5-D, 6-D, 7-D, 8-D, 9-A, 10-A