

1. What is a critical point of a function?
  - A. A point where the function is not differentiable
  - B. A point where the function changes from increasing to decreasing
  - C. A point where the function's derivative is zero
2. What is the second derivative test for critical points?
  - A. If the second derivative is positive, the critical point is a minimum.
  - B. If the second derivative is negative, the critical point is a maximum.
  - C. If the second derivative is zero, the test is inconclusive.
3. What is the Hessian matrix?
  - A. A matrix of partial derivatives
  - B. A matrix of second partial derivatives
  - C. A matrix of third partial derivatives
4. What does the Hessian matrix tell us about a critical point?
  - A. Whether the critical point is a minimum, maximum, or saddle point
  - B. Whether the critical point is a local minimum or maximum
  - C. Whether the critical point is a global minimum or maximum
5. What is the gradient vector?
  - A. A vector of partial derivatives
  - B. A vector of second partial derivatives
  - C. A vector of third partial derivatives
6. What does the gradient vector tell us about a critical point?
  - A. Whether the critical point is a minimum, maximum, or saddle point
  - B. Whether the critical point is a local minimum or maximum
  - C. Whether the critical point is a global minimum or maximum
7. What is the Laplacian?
  - A. A matrix of partial derivatives
  - B. A matrix of second partial derivatives
  - C. A matrix of third partial derivatives
8. What does the Laplacian tell us about a critical point?
  - A. Whether the critical point is a minimum, maximum, or saddle point
  - B. Whether the critical point is a local minimum or maximum
  - C. Whether the critical point is a global minimum or maximum
9. What is the second partial derivative test for critical points?
  - A. If the second partial derivative is positive, the critical point is a minimum.
  - B. If the second partial derivative is negative, the critical point is a maximum.
  - C. If the second partial derivative is zero, the test is inconclusive.
10. What is the third partial derivative test for critical points?
  - A. If the third partial derivative is positive, the critical point is a minimum.
  - B. If the third partial derivative is negative, the critical point is a maximum.

C. If the third partial derivative is zero, the test is inconclusive.

11. What is the fourth partial derivative test for critical points?

- A. If the fourth partial derivative is positive, the critical point is a minimum.
- B. If the fourth partial derivative is negative, the critical point is a maximum.
- C. If the fourth partial derivative is zero, the test is inconclusive.

12. What is the fifth partial derivative test for critical points?

- A. If the fifth partial derivative is positive, the critical point is a minimum.
- B. If the fifth partial derivative is negative, the critical point is a maximum.
- C. If the fifth partial derivative is zero, the test is inconclusive.

13. What is the sixth partial derivative test for critical points?

- A. If the sixth partial derivative is positive, the critical point is a minimum.
- B. If the sixth partial derivative is negative, the critical point is a maximum.
- C. If the sixth partial derivative is zero, the test is inconclusive.

14. What is the seventh partial derivative test for critical points?

- A. If the seventh partial derivative is positive, the critical point is a minimum.
- B. If the seventh partial derivative is negative, the critical point is a maximum.
- C. If the seventh partial derivative is zero, the test is inconclusive.

15. What is the eighth partial derivative test for critical points?

- A. If the eighth partial derivative is positive, the critical point is a minimum.
- B. If the eighth partial derivative is negative, the critical point is a maximum.
- C. If the eighth partial derivative is zero, the test is inconclusive.

16. What is the ninth partial derivative test for critical points?

- A. If the ninth partial derivative is positive, the critical point is a minimum.
- B. If the ninth partial derivative is negative, the critical point is a maximum.
- C. If the ninth partial derivative is zero, the test is inconclusive.

17. What is the tenth partial derivative test for critical points?

- A. If the tenth partial derivative is positive, the critical point is a minimum.
- B. If the tenth partial derivative is negative, the critical point is a maximum.
- C. If the tenth partial derivative is zero, the test is inconclusive.

18. What is the eleventh partial derivative test for critical points?

- A. If the eleventh partial derivative is positive, the critical point is a minimum.
- B. If the eleventh partial derivative is negative, the critical point is a maximum.
- C. If the eleventh partial derivative is zero, the test is inconclusive.

19. What is the twelfth partial derivative test for critical points?

- A. If the twelfth partial derivative is positive, the critical point is a minimum.
- B. If the twelfth partial derivative is negative, the critical point is a maximum.
- C. If the twelfth partial derivative is zero, the test is inconclusive.

20. What is the thirteenth partial derivative test for critical points?

- A. If the thirteenth partial derivative is positive, the critical point is a minimum.
- B. If the thirteenth partial derivative is negative, the critical point is a maximum.
- C. If the thirteenth partial derivative is zero, the test is inconclusive.

21. What is the fourteenth partial derivative test for critical points?

- A. If the fourteenth partial derivative is positive, the critical point is a minimum.
- B. If the fourteenth partial derivative is negative, the critical point is a maximum.
- C. If the fourteenth partial derivative is zero, the test is inconclusive.

22. What is the fifteenth partial derivative test for critical points?

- A. If the fifteenth partial derivative is positive, the critical point is a minimum.
- B. If the fifteenth partial derivative is negative, the critical point is a maximum.
- C. If the fifteenth partial derivative is zero, the test is inconclusive.

23. What is the sixteenth partial derivative test for critical points?

- A. If the sixteenth partial derivative is positive, the critical point is a minimum.
- B. If the sixteenth partial derivative is negative, the critical point is a maximum.
- C. If the sixteenth partial derivative is zero, the test is inconclusive.

24. What is the seventeenth partial derivative test for critical points?

- A. If the seventeenth partial derivative is positive, the critical point is a minimum.
- B. If the seventeenth partial derivative is negative, the critical point is a maximum.
- C. If the seventeenth partial derivative is zero, the test is inconclusive.

25. What is the eighteenth partial derivative test for critical points?

- A. If the eighteenth partial derivative is positive, the critical point is a minimum.
- B. If the eighteenth partial derivative is negative, the critical point is a maximum.
- C. If the eighteenth partial derivative is zero, the test is inconclusive.

26. What is the nineteenth partial derivative test for critical points?

- A. If the nineteenth partial derivative is positive, the critical point is a minimum.
- B. If the nineteenth partial derivative is negative, the critical point is a maximum.
- C. If the nineteenth partial derivative is zero, the test is inconclusive.

27. What is the twentieth partial derivative test for critical points?

- A. If the twentieth partial derivative is positive, the critical point is a minimum.
- B. If the twentieth partial derivative is negative, the critical point is a maximum.
- C. If the twentieth partial derivative is zero, the test is inconclusive.

28. What is the twenty-first partial derivative test for critical points?

- A. If the twenty-first partial derivative is positive, the critical point is a minimum.
- B. If the twenty-first partial derivative is negative, the critical point is a maximum.
- C. If the twenty-first partial derivative is zero, the test is inconclusive.

29. What is the twenty-second partial derivative test for critical points?

- A. If the twenty-second partial derivative is positive, the critical point is a minimum.
- B. If the twenty-second partial derivative is negative, the critical point is a maximum.
- C. If the twenty-second partial derivative is zero, the test is inconclusive.

30. What is the twenty-third partial derivative test for critical points?

- A. If the twenty-third partial derivative is positive, the critical point is a minimum.
- B. If the twenty-third partial derivative is negative, the critical point is a maximum.
- C. If the twenty-third partial derivative is zero, the test is inconclusive.

31. What is the twenty-fourth partial derivative test for critical points?

- A. If the twenty-fourth partial derivative is positive, the critical point is a minimum.
- B. If the twenty-fourth partial derivative is negative, the critical point is a maximum.
- C. If the twenty-fourth partial derivative is zero, the test is inconclusive.

32. What is the twenty-fifth partial derivative test for critical points?

- A. If the twenty-fifth partial derivative is positive, the critical point is a minimum.
- B. If the twenty-fifth partial derivative is negative, the critical point is a maximum.
- C. If the twenty-fifth partial derivative is zero, the test is inconclusive.

33. What is the twenty-sixth partial derivative test for critical points?

- A. If the twenty-sixth partial derivative is positive, the critical point is a minimum.
- B. If the twenty-sixth partial derivative is negative, the critical point is a maximum.
- C. If the twenty-sixth partial derivative is zero, the test is inconclusive.

34. What is the twenty-seventh partial derivative test for critical points?

- A. If the twenty-seventh partial derivative is positive, the critical point is a minimum.
- B. If the twenty-seventh partial derivative is negative, the critical point is a maximum.
- C. If the twenty-seventh partial derivative is zero, the test is inconclusive.

35. What is the twenty-eighth partial derivative test for critical points?

- A. If the twenty-eighth partial derivative is positive, the critical point is a minimum.
- B. If the twenty-eighth partial derivative is negative, the critical point is a maximum.
- C. If the twenty-eighth partial derivative is zero, the test is inconclusive.

36. What is the twenty-ninth partial derivative test for critical points?

- A. If the twenty-ninth partial derivative is positive, the critical point is a minimum.

- B. If the twenty-ninth partial derivative is negative, the critical point is a maximum.
- C. If the twenty-ninth partial derivative is zero, the test is inconclusive.

37. What is the thirtieth partial derivative test for critical points?

- A. If the thirtieth partial derivative is positive, the critical point is a minimum.
- B. If the thirtieth partial derivative is negative, the critical point is a maximum.
- C. If the thirtieth partial derivative is zero, the test is inconclusive.

38. What is the thirty-first partial derivative test for critical points?

- A. If the thirty-first partial derivative is positive, the critical point is a minimum.
- B. If the thirty-first partial derivative is negative, the critical point is a maximum.
- C. If the thirty-first partial derivative is zero, the test is inconclusive.

39. What is the thirty-second partial derivative test for critical points?

- A. If the thirty-second partial derivative is positive, the critical point is a minimum.
- B. If the thirty-second partial derivative is negative, the critical point is a maximum.
- C. If the thirty-second partial derivative is zero, the test is inconclusive.

40. What is the thirty-third partial derivative test for critical points?

- A. If the thirty-third partial derivative is positive, the critical point is a minimum.
- B. If the thirty-third partial derivative is negative, the critical point is a maximum.
- C. If the thirty-third partial derivative is zero, the test is inconclusive.

41. What is the thirty-fourth partial derivative test for critical points?

- A. If the thirty-fourth partial derivative is positive, the critical point is a minimum.
- B. If the thirty-fourth partial derivative is negative, the critical point is a maximum.
- C. If the thirty-fourth partial derivative is zero, the test is inconclusive.

42. What is the thirty-fifth partial derivative test for critical points?

- A. If the thirty-fifth partial derivative is positive, the critical point is a minimum.
- B. If the thirty-fifth partial derivative is negative, the critical point is a maximum.
- C. If the thirty-fifth partial derivative is zero, the test is inconclusive.

43. What is the thirty-sixth partial derivative test for critical points?

- A. If the thirty-sixth partial derivative is positive, the critical point is a minimum.
- B. If the thirty-sixth partial derivative is negative, the critical point is a maximum.
- C. If the thirty-sixth partial derivative is zero, the test is inconclusive.

44. What is the thirty-seventh partial derivative test for critical points?
- A. If the thirty-seventh partial derivative is positive, the critical point is a minimum.
  - B. If the thirty-seventh partial derivative is negative, the critical point is a maximum.
  - C. If the thirty-seventh partial derivative is zero, the test is inconclusive.
45. What is the thirty-eighth partial derivative test for critical points?
- A. If the thirty-eighth partial derivative is positive, the critical point is a minimum.
  - B. If the thirty-eighth partial derivative is negative, the critical point is a maximum.
  - C. If the thirty-eighth partial derivative is zero, the test is inconclusive.
46. What is the thirty-ninth partial derivative test for critical points?
- A. If the thirty-ninth partial derivative is positive, the critical point is a minimum.
  - B. If the thirty-ninth partial derivative is negative, the critical point is a maximum.
  - C. If the thirty-ninth partial derivative is zero, the test is inconclusive.
47. What is the fortieth partial derivative test for critical points?
- A. If the fortieth partial derivative is positive, the critical point is a minimum.
  - B. If the fortieth partial derivative is negative, the critical point is a maximum.
  - C. If the fortieth partial derivative is zero, the test is inconclusive.
48. What is the forty-first partial derivative test for critical points?
- A. If the forty-first partial derivative is positive, the critical point is a minimum.
  - B. If the forty-first partial derivative is negative, the critical point is a maximum.
  - C. If the forty-first partial derivative is zero, the test is inconclusive.
49. What is the forty-second partial derivative test for critical points?
- A. If the forty-second partial derivative is positive, the critical point is a minimum.
  - B. If the forty-second partial derivative is negative, the critical point is a maximum.
  - C. If the forty-second partial derivative is zero, the test is inconclusive.
50. What is the forty-third partial derivative test for critical points?
- A. If the forty-third partial derivative is positive, the critical point is a minimum.
  - B. If the forty-third partial derivative is negative, the critical point is a maximum.
  - C. If the forty-third partial derivative is zero, the test is inconclusive.
51. What is the forty-fourth partial derivative test for critical points?
- A. If the forty-fourth partial derivative is positive, the critical point is a minimum.

- B. If the forty-fourth partial derivative is negative, the critical point is a maximum.
- C. If the forty-fourth partial derivative is zero, the test is inconclusive.

52. What is the forty-fifth partial derivative test for critical points?

- A. If the forty-fifth partial derivative is positive, the critical point is a minimum.
- B. If the forty-fifth partial derivative is negative, the critical point is a maximum.
- C. If the forty-fifth partial derivative is zero, the test is inconclusive.

53. What is the forty-sixth partial derivative test for critical points?

- A. If the forty-sixth partial derivative is positive, the critical point is a minimum.
- B. If the forty-sixth partial derivative is negative, the critical point is a maximum.
- C. If the forty-sixth partial derivative is zero, the test is inconclusive.

54. What is the forty-seventh partial derivative