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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. The slope of the tangent line   to the graph at the point (2,-2) is   |  |  |  | | --- | --- | --- | |  | a. | -2 | |  | b. | 2 | |  | c. |  | |  | d. |  | |  | e. | -4 |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2. The slope of the tangent line to the graph at the point (4,6) is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. | ​ |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 3. The slope of the tangent line to the graphat the point (-1,1) is  ​   |  |  |  | | --- | --- | --- | |  | a. | -3 | |  | b. | -2 | |  | c. | -1 | |  | d. | 1 | |  | e. | 2 |  |  |  | | --- | --- | | *ANSWER:* | e | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 4. The slope of the tangent line to the graphat the point (-3, 2) is  ​   |  |  |  | | --- | --- | --- | |  | a. | -3 | |  | b. | -2 | |  | c. | 2 | |  | d. | 3 | |  | e. | 4 |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 5. An equation of the tangent line to the graphat the point (-2, 6) is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 6. An equation of the tangent line to the graph at the point (-1,-3) is   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 7. An equation of the tangent line to the graph at the point (1, 3) is   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 8. An equation of the tangent line to the graph at the point (6, 3) is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 9. The instantaneous rate of change of at *c* = 5 is  ​   |  |  |  | | --- | --- | --- | |  | a. | -3 | |  | b. | 4 | |  | c. | 5 | |  | d. | 17 | |  | e. | 20 |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 10. The instantaneous rate of change of  at *c* = 3 is  ​   |  |  |  | | --- | --- | --- | |  | a. | -2 | |  | b. | -1 | |  | c. |  | |  | d. |  | |  | e. | 2 |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 11. The instantaneous rate of change of at *c* = 4 is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. | 1 | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 12. The instantaneous rate of change of at *c* = 2 is  ​   |  |  |  | | --- | --- | --- | |  | a. | -5 | |  | b. | -3 | |  | c. | -2 | |  | d. | 3 | |  | e. | 5 |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 13. The instantaneous rate of change of at *c* = 2 is  ​   |  |  |  | | --- | --- | --- | |  | a. | ​  -3  ​ | |  | b. | ​  ​ | |  | c. | ​  ​ | |  | d. | ​  1  ​ | |  | e. | ​  3  ​  ​ |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 14. The instantaneous rate of change of at *c* = 9 is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. | ​ |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 15. The derivative of at *x* = –1 is  ​   |  |  |  | | --- | --- | --- | |  | a. | -6 | |  | b. | -3 | |  | c. | -1 | |  | d. | 3 | |  | e. | 6 |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 16. The derivative of at *x* = –2 is  ​   |  |  |  | | --- | --- | --- | |  | a. | -4 | |  | b. | -2 | |  | c. | -1 | |  | d. | 2 | |  | e. | 4 |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 17. The derivative of  at *x* = 8 is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. | ​ |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 18. The derivative of at *x* = 0 is  ​   |  |  |  | | --- | --- | --- | |  | a. | -8 | |  | b. | 7 | |  | c. | 0 | |  | d. | 8 | |  | e. | -7 |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 19. The derivative of at *x* = –4 is  ​   |  |  |  | | --- | --- | --- | |  | a. | -5 | |  | b. | -4 | |  | c. | 1 | |  | d. | 4 | |  | e. | 5 |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 20. The derivative of at *x* = 4 is  ​   |  |  |  | | --- | --- | --- | |  | a. | -4 | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 21. A pump is used to empty a 350-gallon hot tub. The table shows the amount of water, *W*(*t*), measured in gallons, remaining in the hot tub at time *t*, measured in minutes after the pump is turned on.     |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | *T* | 0 | 15 | 30 | 45 | 60 | 90 | | *W*(*t*) | 350 | 320 | 280 | 225 | 170 | 105 |     Approximate *W*'(30) in this context.   |  |  |  | | --- | --- | --- | |  | a. | Water is draining at a rate of 28/3 gallons per minute when the pump has been operating for 30 minutes. | |  | b. | Forty gallons of water have been removed from the hot tub in 15 minutes of time. | |  | c. | There are 280 gallons of water in the hot tub 30 minutes after the pump is turned on. | |  | d. | Water is draining from the hot tub at a rate of 8/3 gallons per minute when the pump has been operating for 30 minutes. | |  | e. | Water is draining from the hot tub at a rate of 280 gallons per half-hour. |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 22. A dehumidifier is used to reduce the moisture in a basement. The level of moisture reported on the display panel when the dehumidifier is turned on is 70%. The percent moisture, *P*(*t*), at time *t*is recorded for different times *t*in the table.     |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | *T* | 0 | 2 | 6 | 15 | 20 | 30 | | *P*(*t*) | 70 | 67 | 60 | 53 | 51 | 50 |   ​  Estimate *P*'(20).   |  |  |  | | --- | --- | --- | |  | a. | –0.20% per minute | |  | b. | –0.10% per minute | |  | c. | 0.10% per minute | |  | d. | 0.20% per minute | |  | e. | 0.40% per minute |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 23. Let . Then is  ​   |  |  |  | | --- | --- | --- | |  | a. | -2x | |  | b. |  | |  | c. | 2x | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 24. Let Then is   |  |  |  | | --- | --- | --- | |  | a. | -4 | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. | 4 |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 25. Let Then is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 26. Let Then is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 27. Let Then is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 28. Let. Then  is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. | 1 | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 29. Let Then does not exist if *x*is  ​   |  |  |  | | --- | --- | --- | |  | a. | -9 | |  | b. | -5 | |  | c. | 5 | |  | d. | 6 | |  | e. | 9 |  |  |  | | --- | --- | | *ANSWER:* | e | |

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| 30. Let . Then does not exist if *x*is  ​   |  |  |  | | --- | --- | --- | |  | a. | 0 | |  | b. | 1 | |  | c. | 4 | |  | d. | 9 | |  | e. | 16 |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 31. Let. Then does not exist if *x*is  ​   |  |  |  | | --- | --- | --- | |  | a. | -2 | |  | b. | -1 | |  | c. | 0 | |  | d. | 1 | |  | e. | 2 |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 32. Let Then does not exist if *x*is  ​   |  |  |  | | --- | --- | --- | |  | a. | -5 | |  | b. | 1 | |  | c. | 2 | |  | d. | 3 | |  | e. | 5 |  |  |  | | --- | --- | | *ANSWER:* | e | |

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| 33. Let Which of the following is true?  ​   |  |  |  | | --- | --- | --- | |  | a. | is discontinuous at 0 . | |  | b. | has a derivative at 0. | |  | c. | has a corner at (0,0). | |  | d. | has a horizontal tangent line at (0,0). | |  | e. | has a vertical tangent line at (0,0). |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 34. Let Which of the following is true?  ​   |  |  |  | | --- | --- | --- | |  | a. | is discontinuous at 0. | |  | b. | has a derivative at 0. | |  | c. | has a corner at (0,0). | |  | d. | has a horizontal tangent line at (0,0). | |  | e. | has a vertical tangent line at (0,0). |  |  |  | | --- | --- | | *ANSWER:* | e | |

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| 35. Let  Which of the following is true?  ​   |  |  |  | | --- | --- | --- | |  | a. | is discontinuous at 0. | |  | b. | has a derivative at 0. | |  | c. | has a corner at (0,0). | |  | d. | has a horizontal tangent line at (0,0). | |  | e. | has a vertical tangent line at (0,0). |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 36. Let Which of the following is true?  ​   |  |  |  | | --- | --- | --- | |  | a. | is discontinuous at 0. | |  | b. | does not have a derivative at 0. | |  | c. | has a corner at (0,0). | |  | d. | has a horizontal tangent line at (0,0). | |  | e. | has a vertical tangent line at (0,0). |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 37. Let Which of the following is true?  ​   |  |  |  | | --- | --- | --- | |  | a. | is discontinuous at 0. | |  | b. | does not have a derivative at 0. | |  | c. | has a corner at (0,0). | |  | d. | has a horizontal tangent line at (0,0). | |  | e. | has a vertical tangent line at (0,0). |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 38. Let Which of the following is true?  ​   |  |  |  | | --- | --- | --- | |  | a. | is discontinuous at 0. | |  | b. | has a derivative at 0. | |  | c. | has a corner at (0,0). | |  | d. | has a horizontal tangent line at (0,0). | |  | e. | has a vertical tangent line at (0,0). |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 39. Let Which of the following is true?  ​   |  |  |  | | --- | --- | --- | |  | a. | is discontinuous at 0. | |  | b. | does not have a derivative at 0. | |  | c. | has a corner at (0,0). | |  | d. | has a horizontal tangent line at (0,0). | |  | e. | has a vertical tangent line at (0,0). |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 40. Let Which of the following is true?  ​   |  |  |  | | --- | --- | --- | |  | a. | is discontinuous at 0. | |  | b. | has a derivative at 0. | |  | c. | has a corner at (0,0). | |  | d. | has a horizontal tangent line at (0,0). | |  | e. | has a vertical tangent line at (0,0). |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 41. Let  Which of the following is true?  ​   |  |  |  | | --- | --- | --- | |  | a. | is discontinuous at 0. | |  | b. | has a derivative at 0. | |  | c. | has a corner at (0,0). | |  | d. | has a horizontal tangent line at (0,0). | |  | e. | has a vertical tangent line at (0,0). |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 42. Let . Which of the following is true?  ​   |  |  |  | | --- | --- | --- | |  | a. | is discontinuous at 0. | |  | b. | has a derivative at 0. | |  | c. | has a corner at (0,0). | |  | d. | has a horizontal tangent line at (0,0). | |  | e. | has a vertical tangent line at (0,0). |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 43. Let Then is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. | 0 |  |  |  | | --- | --- | | *ANSWER:* | e | |

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| 44. Let  Then  is  ​   |  |  |  | | --- | --- | --- | |  | a. | 0 | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 45. Let Then  if *x* is  ​   |  |  |  | | --- | --- | --- | |  | a. | -3 | |  | b. | -1 | |  | c. | 0 | |  | d. | 1 | |  | e. | 3 |  |  |  | | --- | --- | | *ANSWER:* | e | |

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| 46. Let Then if *x* is  ​   |  |  |  | | --- | --- | --- | |  | a. | -2 | |  | b. | -1 | |  | c. | 0 | |  | d. | 1 | |  | e. | 2 |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 47. Let Then if *x* is  ​   |  |  |  | | --- | --- | --- | |  | a. | –*e* | |  | b. | -1 | |  | c. | 0 | |  | d. | 1 | |  | e. | *e* |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 48. Let Then if *x* is  ​   |  |  |  | | --- | --- | --- | |  | a. | -6 | |  | b. | –ln 6 | |  | c. | 0 | |  | d. | ln 6 | |  | e. | 6 |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 49. Let Then  for all *x* in  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | e | |

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| 50. Let Then  for all *x* in  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | e | |

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| 51. Let Then  for all *x* in  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 52. LetThen for all *x* in  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. | ​ |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 53. Let  Then which of the following is the largest interval, of those listed, for which for all *x* in that interval?  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 54. Let  Then which of the following is the largest interval, of those listed, for which for all *x* in that interval?  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 55. Let Then which of the following is the largest interval, of those listed, for which  for all *x* in that interval?  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. | (-3,3) | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 56. Let . Then for all *x* in  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 57. Let. Then which of the following is the largest interval, of those listed, for which for all *x* in that interval?  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 58. Let Then which of the following is the largest interval, of those listed, for which for all *x* in that interval?  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | e | |

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| 59. Let Then which of the following is the largest interval, of those listed, for which  for all *x* in that interval?  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | e | |

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| 60. Let  Then which of the following is the largest interval, of those listed, for which for all *x* in that interval?  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 61. Let Then which of the following is the largest interval, of those listed, for which for all *x* in that interval?  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | e | |

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| 62. Let Then which of the following is the largest interval, of those listed, for which for all *x*  in that interval?  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. | (0,4) | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 63. What is the equation of the normal line to the graph of at ?  ​   |  |  |  | | --- | --- | --- | |  | a. | *y* = *x* | |  | b. | *y* = –*x* | |  | c. | *y* + 1 = *x* – 1 | |  | d. | *x* = 1 | |  | e. | *y* = –1 |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 64. What is the equation of the normal line to the graph of at ?  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 65. Let.  Then  is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 66. Let . Then is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. | ​ |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 67. Let Then is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 68. Let Then is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 69. Let . Then is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | e | |

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| 70. Let Then is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 71. Let Then is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 72. Let  Then  is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 73. Let Then is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. | ​ |  |  |  | | --- | --- | | *ANSWER:* | e | |

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| 74. Let Then is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 75. Let Then is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 76. Let  Assuming is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 77. Let Then is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 78. Let Assuming  is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. | 0 | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 79. Let  Then is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. | ​ |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 80. The fourth derivative is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 81. The fifth derivative is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | e | |

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| 82. The second derivative is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. | 0 | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 83. The sixth derivative  is  ​   |  |  |  | | --- | --- | --- | |  | a. | 720 | |  | b. |  | |  | c. | 0 | |  | d. | -720 | |  | e. | -720 |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 84. Let  Then is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. | 0 | |  | c. |  | |  | d. |  | |  | e. | ​ |  |  |  | | --- | --- | | *ANSWER:* | e | |

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| 85. Let  Then  is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 86. Let Then  is  ​   |  |  |  | | --- | --- | --- | |  | a. | –tan *x* | |  | b. | cot *x* | |  | c. | –cot *x* – csc *x* | |  | d. | –csc *x*(cot *x* + csc *x*) | |  | e. | –csc *x*(cot *x* – csc *x*) |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 87. Let . Then is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 88. Let Then is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 89. Let  Then  is   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | c | |

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| 90. Let Then is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. | 1 | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 91. Let  Then is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | d | |

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| 92. Let If  then *ƒ* has a horizontal tangent line for each *x* in  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 93. Let If  then *ƒ* has a horizontal tangent line for each *x* in  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. | ​ |  |  |  | | --- | --- | | *ANSWER:* | e | |

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| 94. Let If  then *ƒ* has a horizontal tangent line for each *x* in  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | e | |

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| 95. Let If , then *ƒ* has a horizontal tangent line for each *x* in  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | e | |

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| 96. Let If then *ƒ* has a horizontal tangent line for each *x* in  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | e | |

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| 97. Let If then *ƒ* has a horizontal tangent line for each *x* in  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | e | |

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| 98. Let If then *ƒ* has a horizontal tangent line for each *x* in   |  |  |  | | --- | --- | --- | |  | a. | 0 | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 99. Let  *y* = *x* cos *x*. Then  is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | e | |

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| 100. Let Then  is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 101. Let Then is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 102. Let  Then is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | a | |

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| 103. Let Then is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | b | |

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| 104. Let  Then is  ​   |  |  |  | | --- | --- | --- | |  | a. |  | |  | b. |  | |  | c. |  | |  | d. |  | |  | e. |  |  |  |  | | --- | --- | | *ANSWER:* | a | |