1. E: No value of will allow to be differentiable at since the graph will always have a kink at
2. A: Let . Then
3. C:
4. B: . Hence,
5. A:
6. B: Let . Taking the derivative of both sides yields: . Letting
7. A: . To convert between I and III, make the substitution
8. A: Use partial fractions.
9. D, E: . Note that . At ,
10. C: . Thus, .
11. B: I is false if you consider a line with a removable discontinuity. II is true by the epsilon-delta definition of a limit. III is false if you consider a line with a non-removable discontinuity.
12. C: Let and represent the height and radius, respectively, of the wet part of the cone. Also, let = volume of dry portion of cone. Note that because of the properties of similar triangles. Then, With and , we have that
13. C: I is false if . II is false since the inverse would increase. III is true by applying . IV is false since . Hence the sum is -1.
14. E: I is true because its limit points are -1 and 1. II is false because if we put a neighborhood of ½ around 2, then this neighborhood contains no point of the set. Thus, this set contains 0 limit points. III is true since the interval is dense and we can get arbitrarily close to any to any element and still contain another element of the set.
15. A: Note that and . Hence, is a local max.
16. C: at . Plugging in reveals is the greater function on the interval . Thus, the area between the graphs is:
17. C: . Note that . Hence, . Thus, .
18. D:
19. D: Plug and chug!
20. B: Right Riemann Sum =
21. A: For , we want to minimize subject to the constraint . Thus, . Thus, . Because of simplification, we assume that , which does not affect the final solution. Hence, .
22. C: h’’(0) does not exist because of the sharp turn at t = 0.
23. A: . To determine what is, try to determine what x value will have . To do this, we need . Thus, . Also, . Hence, . Hence, b – ca = 17 – 2 = 15.
24. A: Use the Shell method.
25. A: . Thus, . Hence, Mrs. Linder needs .
26. E: (i) is , (ii) is , (iii) is . Notice that (iii) has positive curvature until and negative curvature afterwards. (ii) captures this change in curvature, suggesting it is while (i) is . Thus, (i) must be .
27. E: Maximum height obtained when . Average velocity is represented by:
28. D: First multiply the function by to obtain . Using the identity , the integral becomes . Apply identity to obtain:

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1. + n(ain: l becomeson sented by: height.it is thrown (ty is zero. seby the graphs plane. A, E: Use implicit differentiation to find: . Hence, A is true. B and C are false because the second derivative is undefined at y = 0.
2. E: . Note that this question is asking for an alternate value of 9.99999…