List for mindmap

Definitions

1. Supremum, infimum.
2. Maximum, minimum.
3. Sequence
4. Sequence bounded from below, above, bounded.
5. Increasing, decerasing, non-decreasing, non-increasing, monotone, strictly monotone sequence.
6. Finite or infinite limit of a sequence. Convergent, divergent sequence.
7. Subsequence.
8. Mapping, image, pre-image of an element. Graph, range of the mapping. Image, pre-image of a set.
9. Onto, one-to-one, bijective mapping.
10. Function increasing, decreasing, non-decreasing, non-increasing, monotone, strictly monotone on an interval.
11. Function bounded, bounded from above, from below.
12. Function even, odd, periodic.
13. Neigbourhood, punctured neighbourhood of a point, of infinities. Left, right neighbourhoods.
14. Limit of a function (finite, infinite). Limit from left, right.
15. Function continuous at a point.
16. Local minimum, local maximum, strict local minimum, strict local maximum with respect to M.
17. Derivative of a function at a point. Derivative from left, right.
18. Tangent to the graph.
19. Convex, concave, strictly convex, strictly concave function.
20. Inflection point.
21. Asymptote.

Theorems

1. Uniqueness of a sequence limit. **Proof**.
2. Boundedness of a convergent sequence. **Proof**.
3. Limit of a subsequence. **Proof**.
4. Arithmetics of limit (of a sequence). **Proof** (i) and (ii).
5. Two policemen/sandwich theorem (for sequences). **Proof**.
6. Corolllary: bounded and zero sequence.
7. Limit of a monotone sequence.
8. Uniqueness of a limit (function).
9. Arithmetics of limit (of a function).
10. Limits and inequalities. **Proof** (iii).

11. Limit of functions: bounded times zero. **Proof**.
12. Limit of a composition of functions.
13. Extrema of continuous function.
14. Derivative and continuity. **Proof**.
15. Arithmetics of derivatives. **Proof** (i) and (ii).
16. Derivative of compound function.
17. Necessary condition for a local extremum. **Proof**.
18. Sign of the derivative and monotonicity. **Proof** (i).
19. Computation of one-sided derivative.
20. l'Hospital's rule
21. Second derivative and convexity. **Proof** (i).
22. Sufficient condition for inflection. **Proof**.
23. Form of asymptote. **Proof**.