Abstract: Let $P = (p_1, p_2, \dots, p_N)$ be a sequence of points in the plane, where $p_i = (x_i, y_i)$ and $x_1 < x_2 < \cdots < x_N$. A famous 1935 Erdős–Szekeres theorem asserts that every such P contains a monotone subsequence S of $\lceil \sqrt{N} \rceil$ points. Another, equally famous theorem from the same paper implies that every such P contains a convex or concave subsequence of $\Omega(\log N)$ points. First we define a $(k+1)$-tuple $K \subseteq P$ to be *positive* if it lies on the graph of a function whose kth derivative is everywhere nonnegative, and similarly for a *negative* $(k+1)$-tuple. Then we say that $S \subseteq P$ is *kth-order monotone* if its $(k+1)$-tuples are all positive or all negative. In this thesis we investigate quantitative bound for the corresponding Ramsey-type result. We obtain an $\Omega(\log^{(k-1)} N)$ lower bound ($(k-1)$-times iterated logarithm). We also improve bounds for related problems: Order types and One-sided sets of hyperplanes.