We present a survey of results that estimate the mean value of the number of real roots of an algebraic polynomial of degree n when the coefficients of that polynomial are random variables and n is a large integer. Of particular interest is the special case in which the coefficients are independent, normally distributed random variables, each with mean 0 and variance 1, although we will discuss some results for several other coefficient distributions. In all the cases considered the mean number of real roots is $O(\log n)$, so that there are relatively few real roots. We also mention the small number of results known for estimating the variance of the number of real roots. We then consider analogous issues for trigonometric cosine polynomials of the form, $a_1 \cos x + a_2 \cos 2x + \cdots + a_n \cos nx$, and estimate the mean number of zeros of this polynomial that lie in the interval $(0, 2p)$. In contrast to the algebraic case, this mean number is $An + o(n)$ for some constant A that depends on the coefficient distribution.