Quiz 9

1. The smallest number with n digits is always of the form 10^{n-1}. Thus the smallest product, and therefore the smallest number digits is

$$10^{n-1} \times 10^{n-1} = 10^{2n-2},$$

which has $2n - 1$ digits.

2. The $n \log n$ barrier is the theoretical lower bound for the average case efficiency of any comparison based sorting algorithm.

3. If there are no equal elements in the array then the loop would never break early, thus there would be $n - 1$ comparisons.