C-3.2

Since r is represented with 100 bits, any candidate p that the eavesdropper might use to try to divide r uses also at most 100 bits. Thus, this very naive algorithm requires 2^{100} divisions, which would take about 2^{80} seconds, or at least 2^{55} years. Even if the eavesdropper uses the fact that a candidate p need not ever be more than 50 bits, the problem is still difficult. For in this case, 2^{50} divisions would take about 2^{30} seconds, or about 34 years.

Since each division takes time $O(n)$ and there are 2^{4n} total divisions, the asymptotic running time is $O(n \cdot 2^{4n})$.