Methods for generating a list of primes

Method 1:
   a.) First, check if \( n=2 \). If it is, \( n \) is prime. Otherwise, proceed to step b.
   b.) Check to see if each integer \( k \) is a divisor of \( n \) where \( 2 < k < n \). If none of the values of \( k \) are divisors of \( n \), then \( n \) is prime

Method 2:
   a.) First, check if \( n=2 \). If it is, \( n \) is prime. Otherwise, proceed to step b.
   b.) Check to see if each integer \( k \) is a divisor of \( n \) where \( 2 < k < \sqrt{n} \). If none of the values of \( k \) are divisors of \( n \), then \( n \) is prime

Method 3:
   a.) First, check if \( n=2 \). If it is, \( n \) is prime. Otherwise, proceed to step b.
   b.) Check if \( n \) is divisible by 2. If so, \( n \) is not prime. Otherwise, proceed to step c.
   c.) Check to see if each odd integer \( k \) is a divisor of \( n \) where \( 2 < k < \sqrt{n} \). If none of the values of \( k \) are divisors of \( n \), then \( n \) is prime.

Method 4:
   a.) First, check if \( n=2 \). If it is, \( n \) is prime. Otherwise, proceed to step b.
   b.) Check to see if each prime integer \( k \) is a divisor of \( n \) where \( 2 < k < \sqrt{n} \). If none of the values of \( k \) are divisors of \( n \), then \( n \) is prime.

Exercise:
   Sketch out the code for each of these methods to determine the number of times a specific operation occurs. Use the table below to compare the number of types of operations (compares, division checks, assignments, counter (\( k \)) modifications, and jumps) of the different methods.

<table>
<thead>
<tr>
<th>Method</th>
<th>compares</th>
<th>division checks</th>
<th>assignments</th>
<th>counter modifications</th>
<th>jumps</th>
<th>total</th>
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</thead>
<tbody>
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<td>Method 1</td>
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Using your answers in the table above, identify the rate at which the complexity of each method grows with different values of \( n \).