Quiz on Big-O notation

1. $n^2 - 2023 \cdot n$

   ◯ is in $O(n^2)$, but not in $\Omega(n^2)$ **S**
   ◯ is in $\Omega(n^2)$, but not in $O(n^2)$ **P**
   ◯ is in $\Omega(n^2)$ and in $O(n^2)$ **A**
   ◯ not in $\Omega(n^2)$, or in $O(n^2)$ **E**

2. $2023 \cdot n$

   ◯ is in $O(n^2)$, but not in $\Omega(n^2)$ **L**
   ◯ is in $\Omega(n^2)$, but not in $O(n^2)$ **T**
   ◯ is in $\Omega(n^2)$ and also in $O(n^2)$ **N**
   ◯ not in $\Omega(n^2)$, or in $O(n^2)$ **M**

3. If $f(n) \in O(n^4)$, then $f(n) \in O(n^5)$ also.

   ◯ True **A** ◯ False **E**

4. For the function $\frac{1}{1000}n^3$, is it true that it is in $\Theta(n^3)$

   ◯ True **N** ◯ False **L**

5. Is it possible that for a function $f(n)$ that $f(n) \in O(n)$ and also s $f(n) \in O(n^3)$?

   ◯ True **T** ◯ False **A**

6. If $f(n) \in O(n^2)$ and $g(n) \in \Theta(n^3)$, then $f(n) \in O(g(n))$

   ◯ True **U** ◯ False **G**

7. If $f(n) \in O(n^2)$ and $g(n) \in O(n^3)$, then it is surely true that $f(n) \in O(g(n))$

   ◯ True **E** ◯ False **R**

8. The smallest integer k for which $n^2 \log n \in O(n^k)$ is true is,

   ◯ 2 **H** ◯ 3 **I** ◯ 4 **L**

9. If $f(n) \in \Omega(n)$ and $f(n) \in O(n)$, then $f(n) \in \Theta(n)$.

   ◯ True **N** ◯ False **E**

10. Which of the following functions is NOT in $O(\log n)$?

    ◯ $2023^{2023} \cdot \log n$ **S** ◯ $\log \log n$ **T** ◯ $\frac{1}{2023}n$ **G**