

1. There is no one-to-one correspondence between the set of all positive integers and the set of all odd positive integers because the second set is a proper subset of the first. (True or False)

2. The solution to the recurrence relation: $T(n) = 9T\left(\frac{n}{3}\right) + n^3$ with $T(0) = T(1) = 1$ is...

3. Given the recurrence relation

$$T(n) = 4T(n/2) + n \quad \text{with } T(0) = 1, \text{ then } T(n) =$$

4. Given the recurrence relation

$$T(n) = 4T(n/2) + n^2 \quad \text{with } T(0) = 1, \text{ then } T(n) =$$

5. What is the time complexity (in Θ -notation) in terms of n ?

```
Sum = 0;
for ( i = 0 ; i < n ; i++ )
    for ( j = 1 ; j < n^4 ; j = 4*j )
        sum++;
```

6. What is the time complexity (in Θ -notation) in terms of n ?

```
sum = 0 ;
for ( i = n ; i >= 1 ; i = i/2 )
    for ( j = 0 ; j < n^4 ; j = j+2 )
        sum++;
```

Properties: (1) reflexive (2) symmetric (3) anti-symmetric (4) transitive
 (5) equivalence relation (6) partially ordered

	relation	1	2	3	4	5	6
0	The relation R on the set of all people where aRb means that a is younger than b	no	no	yes	yes	no	no
1	The relation R on the set of all real function $f:\mathbb{N}\rightarrow\mathbb{R}^+$ where $f R g$ if and only if $f(n) = O(g(n))$						
2	The relation R on the set of all real function $f:\mathbb{N}\rightarrow\mathbb{R}^+$ where $f R g$ if and only if $f(n) = \Theta(g(n))$						