

Name: _____

ID number: _____

There are 2 questions for a total of 10 points.

1. (5 points) Consider the following recursive function that takes as input a positive integer.

```
F(n)
· if (n = 1) return
· if (n is odd) F(n - 1)
· else
  · print("Hello World")
  · F(n/2)
```

Give the **exact** expression, in terms of n , for the number of times "Hello World" is printed when a call to $F(n)$ is made. Argue the correctness of your expression using mathematical induction.

2. (5 points) Prove or disprove: $5^{\log_2 n}$ is $O(n^2)$.

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There are 2 questions for a total of 10 points.

1. (5 points) Consider the following recursive function that takes as input a positive integer.

```
F(n)
· if (n = 1) return
· if (n is even)
  · print("Hello World")
  · F(n/2)
· else F(n - 1)
```

Give the **exact** expression, in terms of n , for the number of times "Hello World" is printed when a call to $F(n)$ is made. Argue the correctness of your expression using mathematical induction.

2. (5 points) Prove or disprove: $3^{\log_2 n}$ is $\Omega(n^2)$.