1. Let $*$ be a binary operation on N given by $a * b = \text{HCF}(a, b)$, where $a, b \in N$. Write the value of $22 * 4$.

2. Let $f : N \to N$ be a function defined by

$$f(n) = \begin{cases} \frac{n+1}{2}, & \text{if } n \text{ is odd} \\ \frac{n}{2}, & \text{if } n \text{ is even} \end{cases} \quad \text{for all } n \in N$$

   Find whether the function f is bijective.

3. A manufacturer can sell x items at a price of Rs. $\left(5 - \frac{x}{100}\right)$ each The cost price of x is Rs.$\left(\frac{x}{5} + 500\right)$. Find the number of items he should sell to earn maximum profit.

4. Find the intervals in which the function f given by

$$f(x) = \sin x + \cos x, 0 \leq x \leq 2\pi,$$

   is strictly increasing or strictly decreasing.