Show that P(n) = n^2 - n is divisible by 2 whenever n is a positive integer.

Prove this by mathematical induction by showing that it holds for the base case and showing that it holds for the case n = k + 1 given the case n = k is true.

*Show you solution and submit your answer in the given link.*

# Solution

## Declaration of Mathematical Expression

Let be the mathematical statement:

is divisible by 2

## The Base Case

When n = 1, we have:

The result is 0, which is divisible by 2.

is correct.

## Induction Hypothesis

is correct for some positive integer k. This means is divisible by 2, therefore for some integer m.

## Induction Steps

|  |  |  |
| --- | --- | --- |
|  |  | Expand the two polynomials. |
|  |  | Remove the brackets. |
|  |  | Rearrange to form the target monomial “2m”. |
|  |  | Convert the values into the said target. |
|  |  | Factor out the remaining numbers with the GCD. |
|  |  | Enclose all similarly factored numbers with that factor. |

As , we have the expression , which is divisible by 2.

Therefore, is correct. By mathematical induction, being divisible by 2 is correct for all non-negative integers n.