

Principle of Mathematical Induction

$P(n)$ - a statement that involves
the integer n , such as
"the sum of the first n positive
integers is $\frac{n(n+1)}{2}$."

Suppose $P(1)$

and suppose, for each $k \geq 1$, $P(k) \rightarrow P(k+1)$.

Then the following statement is true:

"For all positive integers n , $P(n)$."

Recurrence Relations

Examples

① $a_1 = 1;$

for each integer $n > 1$, $a_n = 2a_{n-1}$.

What's a_n ?

② $s_0 = 1$, $s_1 = 5$, and

for each integer $n \geq 2$, $s_n = 2s_{n-1} - s_{n-2}$.

What's s_n ?

Homework

5.1: 1, 2, 4(a, b, c, f, j), 6(e, f, g), 9(g).

5.2: 1, 5, 6.