1 Method of Iteration

Procedure Description:

The __________________________ allows us to compute the general term of a sequence from its recurrence relation and initial conditions. This is done by computing successive terms in the sequence until a pattern is observed.

Example: Suppose the recurrence relation is $t_n = 2t_{n-1}$ for $n \geq 2$ with initial condition $t_1 = 3$ (from 9.1). How could we describe the nth term of this sequence?

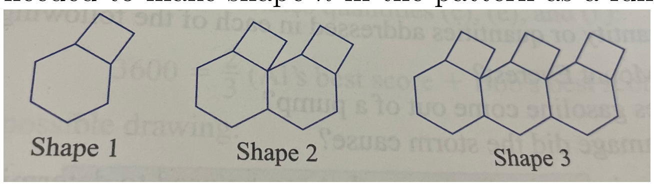
Example: Suppose the recurrence relation is $p_n = p_{n-1} + 2$ for $n \geq 1$ with initial condition $p_0 = 92$ (from 9.1). How could we describe the nth term of this sequence?

Example: Suppose the recurrence relation is $s_n = 2s_{n-1} - 3$ for $n \geq 1$ with initial condition $s_0 = 7$. How could we describe the nth term of this sequence?

Example: Use the method of iteration to help you compute $1 + 2 + 3 + ... + n$.

Example: Use the method of iteration to find a formula expressing s_n as a function of n for the given recurrence relation and initial conditions: $s_n = -s_{n-1} + 10, s_0 = -4$.

Example: Use the method of iteration to find a formula expressing the number of toothpicks needed to make shape n in the pattern as a function of n:



Example: Use the method of iteration to find a formula expressing s_n as a function of n for the given recurrence relation and initial conditions: $s_n = s_{n-1} + 4(n-3), s_0 = 10$.

Example: Use the method of iteration to find a formula expressing s_n as a function of n for the given recurrence relation and initial conditions: $s_n = 3s_{n-2} + 4, s_0 = 1, s_1 = 2$.

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