

1. How many ways can we place 6 nonattacking rooks on the board without using the squares with x in them?

x					
x	x				
		x	x		
		x	x		

2. Use generating functions to solve the recurrence relation  $a_n = 5a_{n-1} - 6a_{n-2}$  with initial values  $a_0 = 1$  and  $a_1 = -2$ .

3. Let  $A$  be the set of natural numbers not divisible by 2, 3 or 5. Find

$$\sum_{k \in A} \frac{1}{2^k}.$$