Solution (#421) Let B_n denote the number of ways to cover a $3 \times n$ grid using 3×1 rectangular tiles. If we start tiling the $3 \times n$ grid from the left, there are two ways to proceed as shown below:

1	$\cdots$	$\cdots$
1	$\cdots$	$\cdots$
1	$\cdots$	$\cdots$

or

1	1	1	$\cdots$
2	2	2	$\cdots$
3	3	3	$\cdots$

If we begin with a vertical tile then there are B_{n-1} ways to continue; if we begin with two horizontal tiles then there are B_{n-3} ways to continue. Hence

$$B_n = B_{n-1} + B_{n-3}.$$

We have $B_1 = 1$, $B_2 = 1$ and $B_3 = 2$. Hence we generate a table

n	1	2	3	4	5	6	7	8	9	10
B_{n-3}				1	1	2	3	4	6	9
B_{n-1}		1	1	2	3	4	6	9	13	19
B_n	1	1	2	3	4	6	9	13	19	28