# Tiling Problems

## Veteran Track


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# Tiling Problems: Set 1

Consider the set of identical $1 \times 2$ and $2 \times 1$ dominoes.

1. How many ways are there to tile a $2 \times 2$ grid with this tileset?
2. How many ways are there to tile a $2 \times 1000$ grid with this tileset? Give your answer $\bmod 10^9 + 7$.
3. How many ways are there to tile a $2 \times 10^{18}$ grid with this tileset? Give your answer $\bmod 10^9 + 7$.

# Tiling Problems: Set 2

Consider the set of identical $1 \times 2$ and $2 \times 1$ dominoes.

1. How many ways are there to tile a $3 \times 2$ grid with this tileset?
2. How many ways are there to tile a $3 \times 1000$ grid with this tileset? Give your answer $\bmod 10^9 + 7$.
3. How many ways are there to tile a $3 \times 10^{18}$ grid with this tileset? Give your answer $\bmod 10^9 + 7$.

# Tiling Problems: Set 3

You have four types of tiles: green $1 \times 1$ tiles, blue $1 \times 1$ tiles, vertical $2 \times 1$ tiles, and horizontal $1 \times 2$ tiles. All tiles of the same type are indistinguishable from one another. Also, the tiles cannot be rotated.

1. How many ways are there to tile a $3 \times 2$ grid with this tileset?
2. How many ways are there to tile a $3 \times 1000$ grid with this tileset? Give your answer $\bmod 10^9 + 7$.
3. How many ways are there to tile a $3 \times 10^{18}$ grid with this tileset? Give your answer $\bmod 10^9 + 7$.