1. (5 points) Tic-tac-toe, or Xs and Os, is a paper-and-pencil game for two players, X and O, who take turns marking the spaces in a $3 \times 3$ grid. The player who succeeds in placing three of their marks in a horizontal, vertical, or diagonal row wins the game. See Figure 1 (a) now O wins. You can use 1 to represent X, -1 to represent O, and 0 to represent no marks. See Figure 1 (b).

![Figure 1: Tic-tac-toe](image)

Solution:

```cpp
#include <iostream>

using namespace std;

int check( int m[3][3] )
{
    if ( m[0][0] == 1 && m[0][1] == 1 && m[0][2] == 1 )
        return 1;
    if ( m[1][0] == 1 && m[1][1] == 1 && m[1][2] == 1 )
        return 1;
    if ( m[2][0] == 1 && m[2][1] == 1 && m[2][2] == 1 )
        return 1;
    if ( m[0][0] == 1 && m[1][0] == 1 && m[2][0] == 1 )
        return 1;
    if ( m[0][1] == 1 && m[1][1] == 1 && m[2][1] == 1 )
        return 1;
    if ( m[0][2] == 1 && m[1][2] == 1 && m[2][2] == 1 )
        return 1;
    if ( m[0][0] == 1 && m[1][1] == 1 && m[2][2] == 1 )
        return 1;
    if ( m[0][2] == 1 && m[1][1] == 1 && m[2][0] == 1 )
        return 1;
    return 0;
}
```
```cpp
int main()
{
    int m[3][3] = {
        { -1, -1, -1 },
        { 0, 1, 0 },
        { 1, 0, 1 }
    };
    cout << check(m) << endl;
}
```