Mock exam exercise

Write a program that controls the movement of the 'Ghost' character of the game PAC-MAN. As you might know, in normal mode the 'Ghost' character follows the 'Pacman' character wherever he goes. Consider the game screen as a 2D space in which the positions of the 'Pacman' and 'Ghost' characters are identified by a pair of coordinates 'x' and 'y'. The program works like this:

- First, it asks the user to introduce the coordinates (x and y) of the 'Pacman' character
- Next, it asks for the coordinates (x and y) of the 'Ghost' character
- Finally, the program prints a number on screen that represents the direction the 'Ghost' character should follow where:

  0 means that the ghost should stay in the same position

  1 means head east

  2 means head northeast

  3 means head north

  4 means head northwest

  5 means head west

  6 means head southwest

  7 means head south

  8 means head southeast

Example of execution:

Introduce x coordinate of Pacman: 3

Introduce y coordinate of Pacman: 3

Introduce x coordinate of Ghost: 0

Introduce y coordinate of Ghost: 0

The direction the ghost should follow is: 2

Solution:

```matlab
clear;
posXPacman = input('Introduce x coordinate of Pacman: ');
posYPacman = input('Introduce y coordinate of Pacman: ');
posXGhost = input('Introduce x coordinate of Ghost: ');
posYGhost = input('Introduce y coordinate of Ghost: ');
direction = -1;

if(posXPacman == posXGhost)
    if(posYPacman == posYGhost)
        direction = 0;
    else
        if(posYPacman > posYGhost)
            direction = 3;
        else
            direction = 7;
        end
    end
elseif(posXPacman < posXGhost)
    if(posYPacman == posYGhost)
        direction = 5;
    else
        if(posYPacman > posYGhost)
            direction = 4;
        else
            direction = 6;
        end
    end
else  % posXPacman > posXGhost
    if(posYPacman == posYGhost)
        direction = 1;
    else
        if(posYPacman < posYGhost)
            direction = 8;
        else
            direction = 2;
        end
    end
end

fprintf('The direction is %d\n', direction);
```