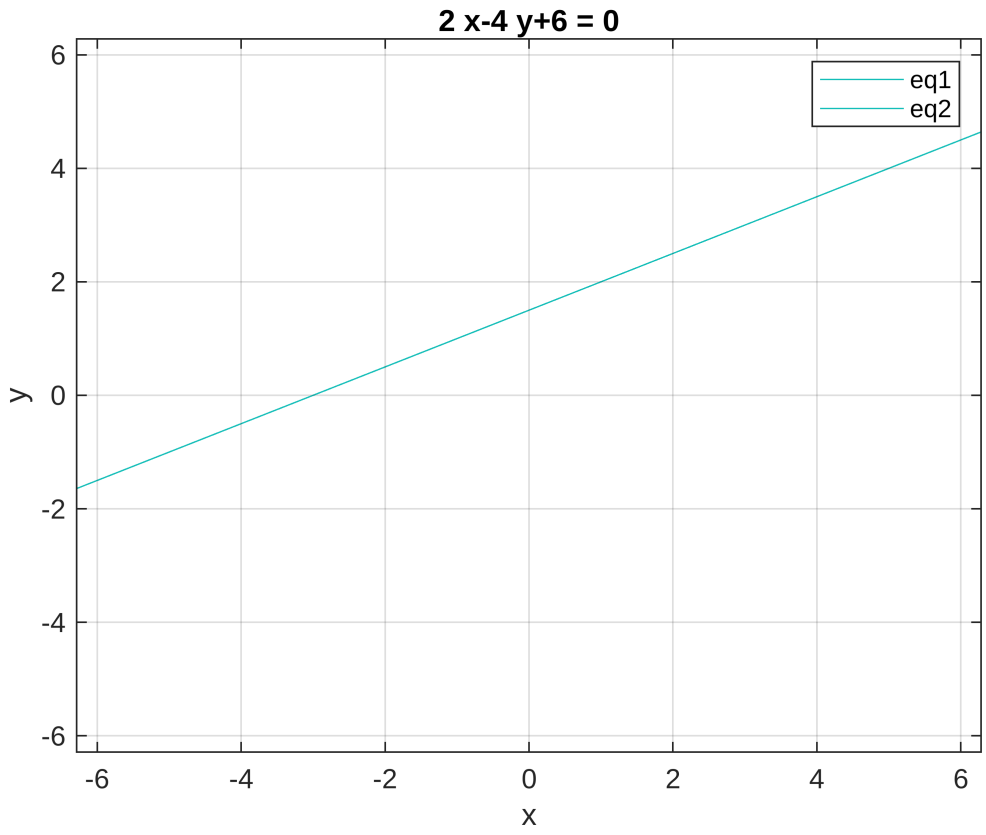
SclafaniLab4

```
ezplot('-x+2*y-3') %eq1
hold on
ezplot('2*x-4*y+6') %eq2
grid
legend('eq1','eq2')
hold off
```




```
%both lines overlap, so there are infinitely many solutions
```

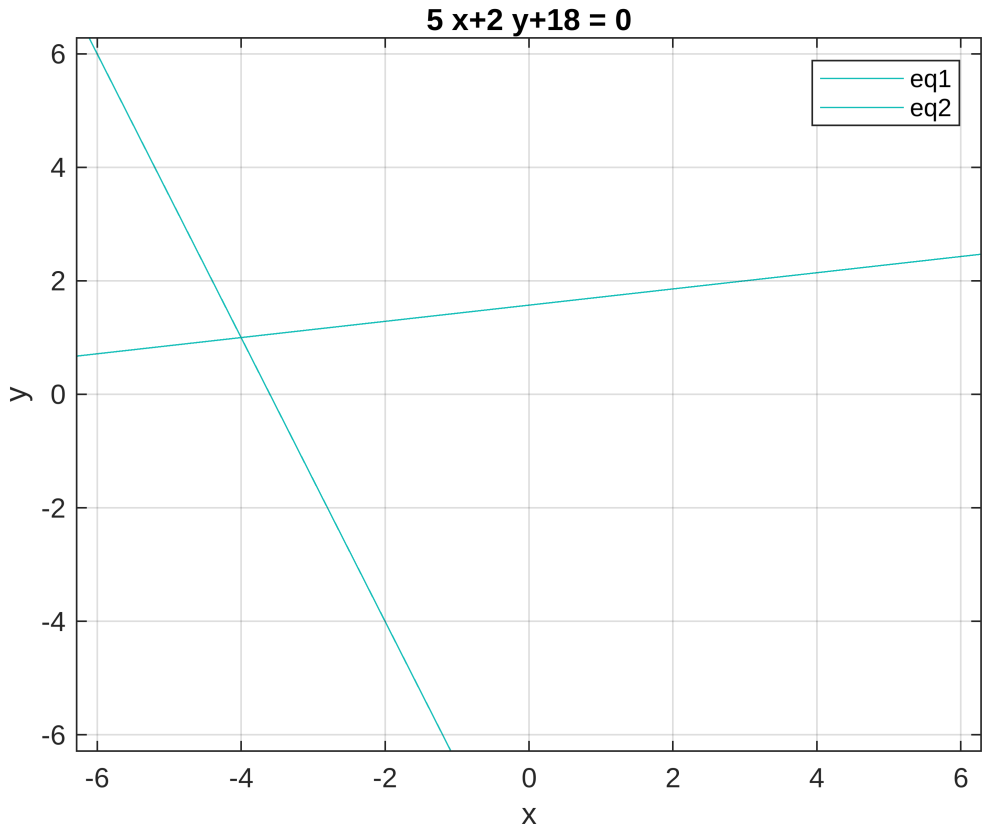
```
A=[-1 2 3; 2 -4 -6];
rref(A)
```

```
ans = 2×3
     1    -2    -3
     0     0     0
```

For part a, the ezplot & rref commands reveal that there are infinitely many solutions to this problem since the entire bottom row is zero.

```
ezplot('x-7*y+11') %eq1
hold on
ezplot('5*x+2*y+18') %eq2
grid
```

```
legend('eq1','eq2')
hold off
```




```
%The lines intersect at about x=-4, y=1
```

```
B=[1 -7 -11 ; 5 2 -18];
rref(B)
```

```
ans = 2×3
     1     0    -4
     0     1     1
```

We get a soltuon of x=-4, y=1

```
%Picking matrix 3
% [? ? 2 ;      % [x1 x2 2 ;
%  ? ? 7 ;      %  x3 x4 7 ;
%  ? ? 6]       %  x5 x6 6]
% x1 + x2 + 2  => x1 + x2 = 13
% x3 + x4 + 7  => x3 + x4 = 8
% x5 + x6 + 6  => x5 + x6 = 9
% x1 + x4 + 6  => x1 + x4 = 9
% x5 + x4 + 2  => x5 + x4 = 13
% x1 + x3 + x5 = 15
% x2 + x4 + x6 = 15
```

```
% 2 + 7 + 6    = 15
C=[ 1 1 0 0 0 0 -1 13 ;
    0 0 1 1 0 0 -1 8 ;
    0 0 0 0 1 1 -1 9 ;
    1 0 0 1 0 0 -1 9 ;
    0 0 0 1 1 0 -1 13 ;
    1 0 1 0 1 0 -1 15 ;
    0 1 0 1 0 1 -1 15] ;
rref(C)
```

```
ans = 7×8
     1     0     0     0     0     0     0     4
     0     1     0     0     0     0     0     9
     0     0     1     0     0     0     0     3
     0     0     0     1     0     0     0     5
     0     0     0     0     1     0     0     8
     0     0     0     0     0     1     0     1
     0     0     0     0     0     0     1     0
```

From the rref we can determine that x1=4, x2=9, x3=3, x4=5, x5=8, x6=1

```
disp(['Therefore, the magic matrix with the given restrictions is unique and
it is the following matrix:'])
```

```
Therefore, the magic matrix with the given restrictions is unique and it is the following matrix:
```

```
G=[ 4 9 2 ;
    3 5 7 ;
    8 1 6 ]
```

```
G = 3×3
     4     9     2
     3     5     7
     8     1     6
```