1)

A)

>> Graph = [0 1/3 0 1/3 1/3; 1/3 0 1/3 0 1/3; 0 1/2 0 1/2 0; 1/2 0 1/2 0 0; 1/2 1/2 0 0 0]'

Graph =

```
0       1/3      0       1/2      1/2
1/3     0        1/2     0        1/2
0       1/3      0       1/2      0
1/3     0        1/2     0        0
1/3     1/3      0       0        0
```

B)

>> rref(Graph-eye(5))

ans =

```
1       0       0       0       -3/2
0       1       0       0       -3/2
0       0       1       0       -1
0       0       0       1       -1
0       0       0       0       0
```

>> [3/2 3/2 1 1]'

ans =

```
3/2
3/2
1
1
```

>> ans/sum(ans)

ans =

```
3/10
3/10
1/5
1/5
```

2)

A)

```
>> Directed_Graph = [0 1/3 1/3 1/3; 0 0 1 0; 0 1/2 0 1/2; 1 0 0 0]'

Directed_Graph =

    0        0        0        1
    1/3      0        1/2      0
    1/3      1        0        0
    1/3      0        1/2      0
```

B)

```
>> rref(Directed_Graph-eye(4))

ans =

    1        0        0        -1
    0        1        0        -1
    0        0        1        -4/3
    0        0        0        0

>> v=[1;1;4/3;1]

v =

    1
    1
    4/3
    1

>> v/sum(v)

ans =

    3/13
    3/13
    4/13
    3/13

>> format bank
>> ans

ans =

    0.23
```

```
        0.23
        0.31
        0.23
```

3)

A)

```
>> weather_graph = [0.65 0.25 0.25;0.1 0.25 0.15;0.25 0.5 0.6]

weather_graph =

    13/20        1/4          1/4
    1/10         1/4          3/20
    1/4          1/2          3/5
```

B)

```
>> x0 = [1;0;0]

x0 =

    1
    0
    0
>> weather_graph^4*x0

ans =

    0.43
    0.14
    0.43
```

4)

A)

```
>> Rain_graph = [0.58 0 0.265 0;0.42 0.29 0.265 0;0 0.355 0.47 0.69;0 0.365 0 0.31]

Rain_graph =

    0.58        0          0.27        0
    0.42        0.29       0.27        0
    0           0.35       0.47        0.69
    0           0.36       0           0.31
```

B)

```
>> x0 = [0 0.29 0.355 0.355]'

x0 =

        0
   0.2900
   0.3550
   0.3550

>> Rain_graph^4*x0

ans =

   0.2362
   0.2765
   0.3613
   0.1357
```