1) Vis at de marginale tæthedsfunktioner for X og Y er givet ved

Matlab code)

```
XMatrix =[ 1 2 3];
YMatrix = [5;6;7;8];
Matrix = [0 1/12 0; 2/12 0 2/12; 2/12 1/12 2/12; 0 2/12 0];

X = sum(Matrix);
Y = sum(Matrix,2);
format rat
X
```

```
X =
       1/3           1/3           1/3
```

```
Y
```

```
Y =
       1/12
       1/3
       5/12
       1/6
```

Matlab code for opgave 2)

```
E_x = sum(XMatrix.*X)
```

```
E_x =
       2
```

```
E_Y = sum(YMatrix .* Y)
```

```
E_Y =
      20/3
```

```
EYX=E_x * E_Y
```

```
EYX =
      40/3
```

```
EX2 = sum(XMatrix.^2 .* X)
```

```
EX2 =
      14/3
```

```
EY2 = sum(YMatrix.^2 .* Y)
```

```
EY2 =
     271/6
```

Matlab code for opgave 3)S

```
VarX = EX2-(E_x.^2);
VarY = EY2 - (E_Y.^2);

p =(EYX - E_x .* E_Y)/(sqrt(VarX)*sqrt(VarY))
```

```
p =
       0
```

Matlab code for opgave 5)

```
inde = kron(Y,X)
```

```
inde =
       1/36           1/36           1/36
       1/9            1/9            1/9
       5/36           5/36           5/36
       1/18           1/18           1/18
```

Matlab code for opgave 6)

```
fxy= Matrix(2,:)./Y(2)
```

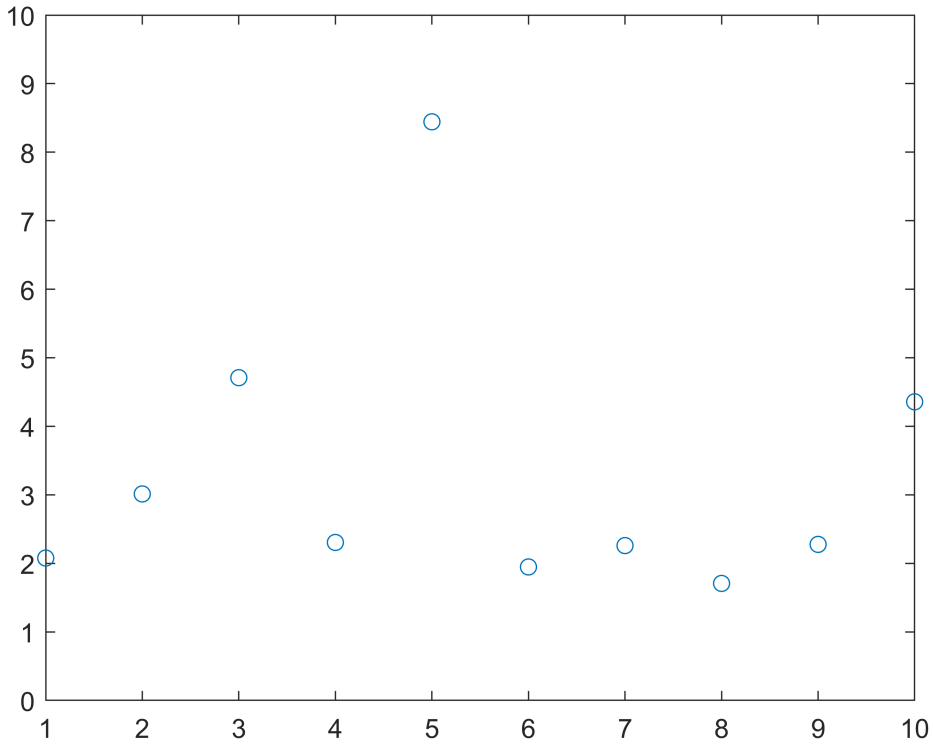
```
fxy =
       1/2            0              1/2
```

Opgave 2

```
clear
clc
format
```

Matlab code for opgave 1

```
for(n = 1:10)
    X(n) = rand * 10;
end
plot(X,'o')
ylim([0 10])
```



Opgave 2

```
mean = (10+0)/2
```

```
mean = 5
```

```
variance = 1/12*(10-0).^2
```

```
variance = 8.3333
```

Opgave 3

Opgave 4 ----

Opgave 1

```
clear
clc
```

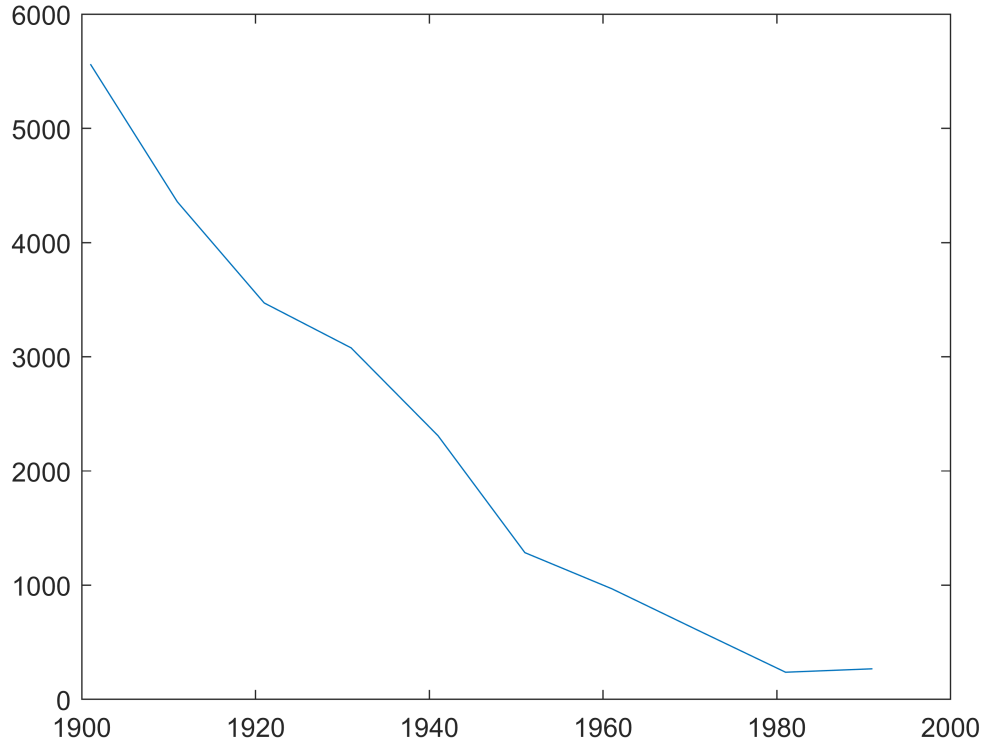
```
antal = [5562 4357 3471 3078 2309 1285 969 602 238 268];
years = [1901:10:1991];

antalMean = mean(antal)
```

```
antalMean = 2.2139e+03
```

```
yearsMean = mean(years)
```

```
yearsMean = 1946
```

```
plot(years, antal)
```




```
polyfit(years, antal, 1)
```

```
ans =
   1.0e+05 *
   -0.0006    1.1800
```