

14b)

```
x1=[1; 2; 3; 4; 5;]
x2=[-2;-1;1;-1];
y=circonv(x1,x2);
```

y =

```
-6
-4
-12
-10
-13
```

c)

```
x1w = fft(x1);
x2w= fft(x2);
y2=x1w.*x2w;
y=ifft(y2);
```

y =

```
-6
-4
-12
-10
-13
```

26)

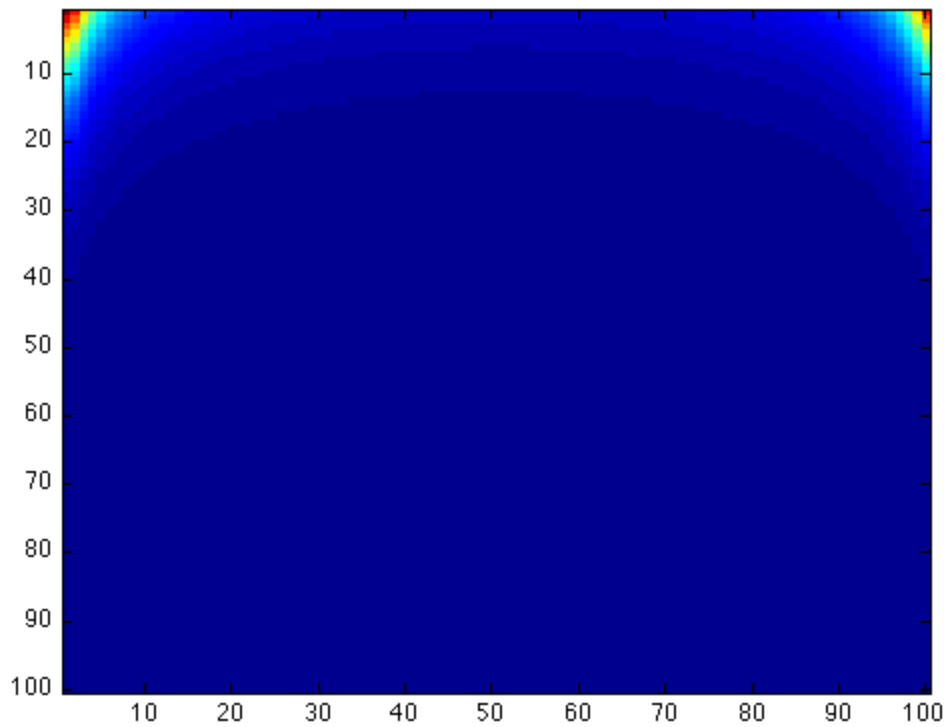
```
x = zeros(100,100);

for m = 1:100
    n = linspace(1,100);
    x(:,m) = power(0.9,m+n);
end
```

```
xf = zeros(100,100);
xm = zeros(100,100);
```

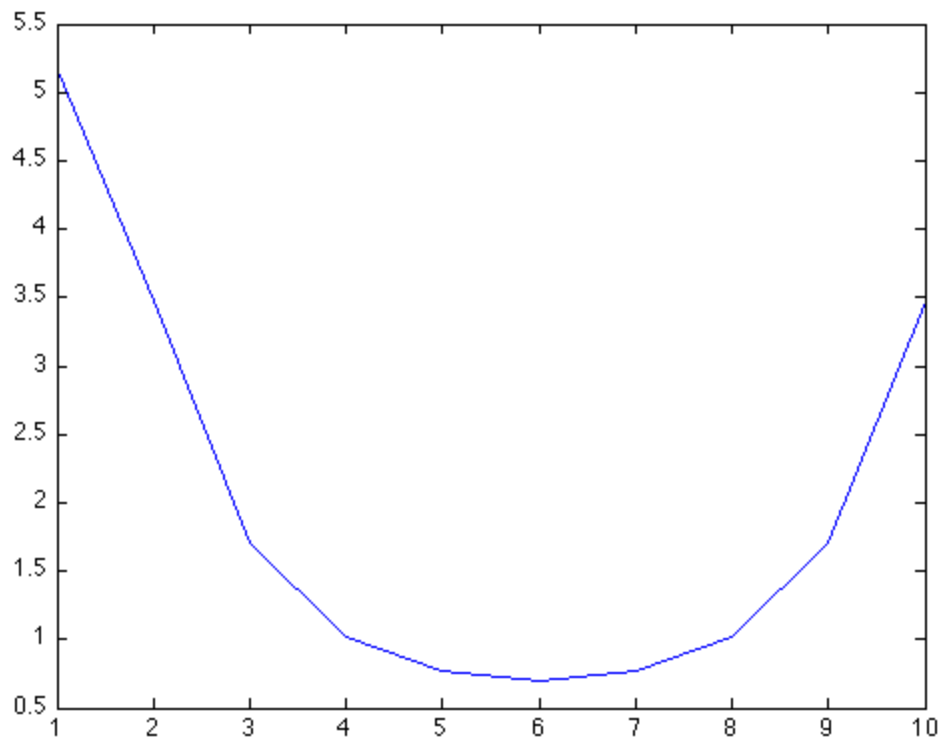
```
for m = 1:100
    xf(m,:) = fft(x(m,:));
    xm(m,:) = abs(xf(m,:));
end
```

```
imagesc(xm);
```

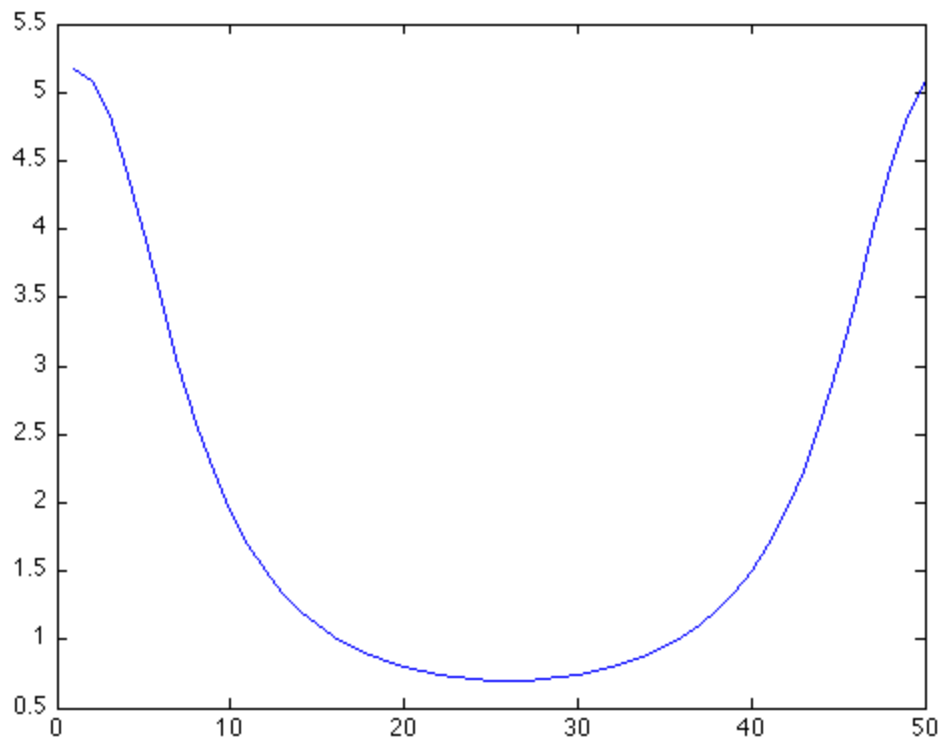


29)

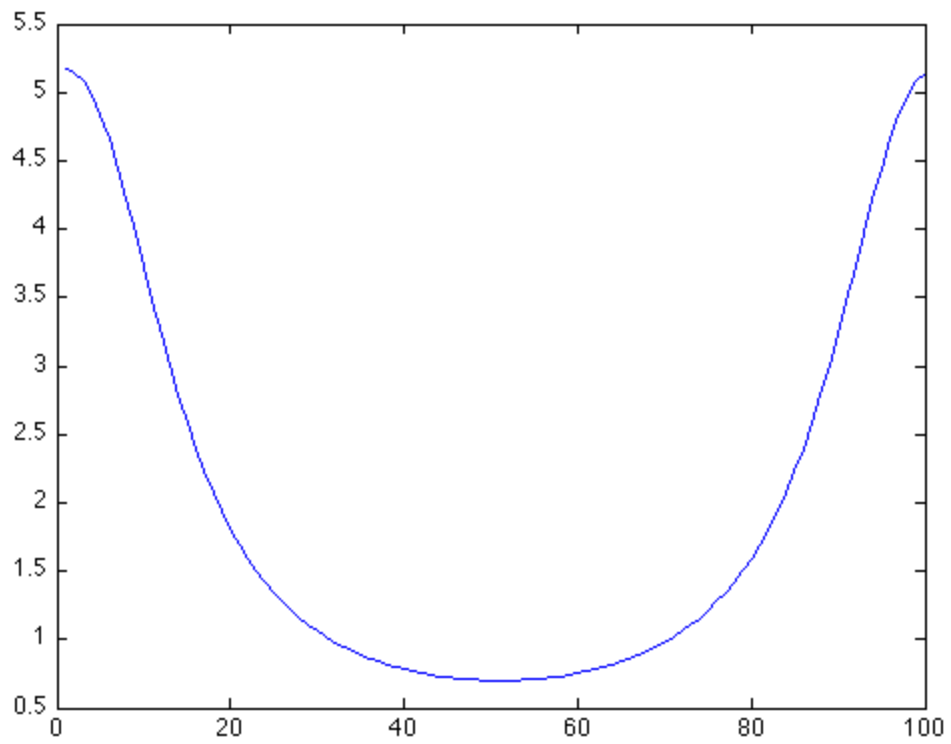
```
C=power(0.5,n);
x=10*C.*sin(0.1*pi*n);
xf = fft(x(1:10));
xm = abs(xf);
plot(xm, 'DisplayName', 'xm', 'YDataSource', 'xm');figure(gcf)
```



```
xf = fft(x(1:50));  
xm=abs(xf);  
plot(xm);
```



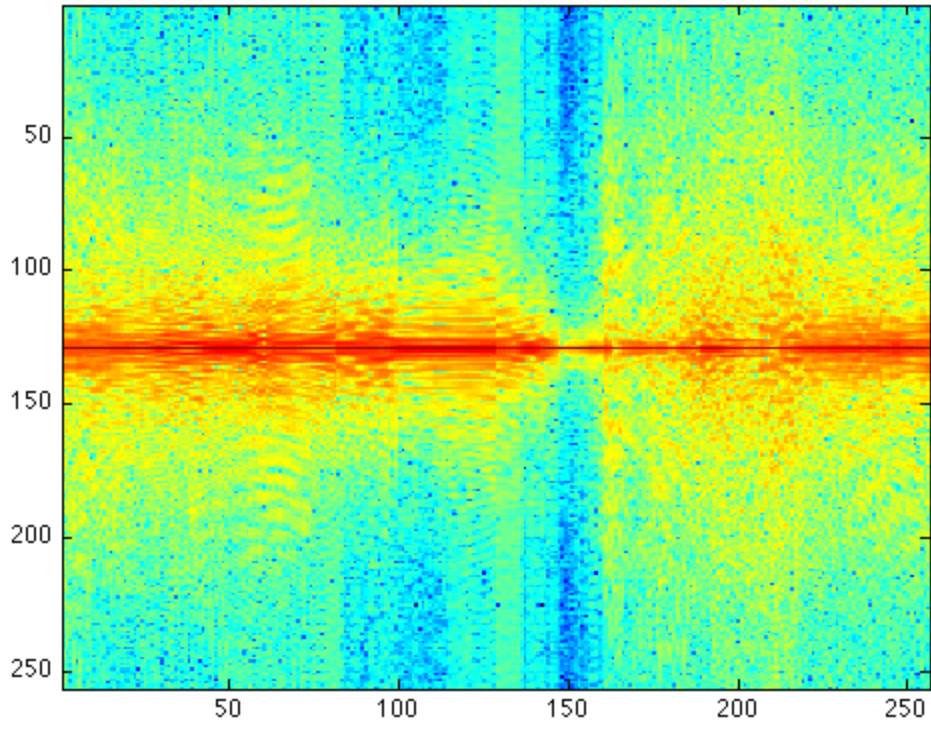
```
xf = fft(x(1:100));  
xm=abs(xf);  
plot(xm);
```

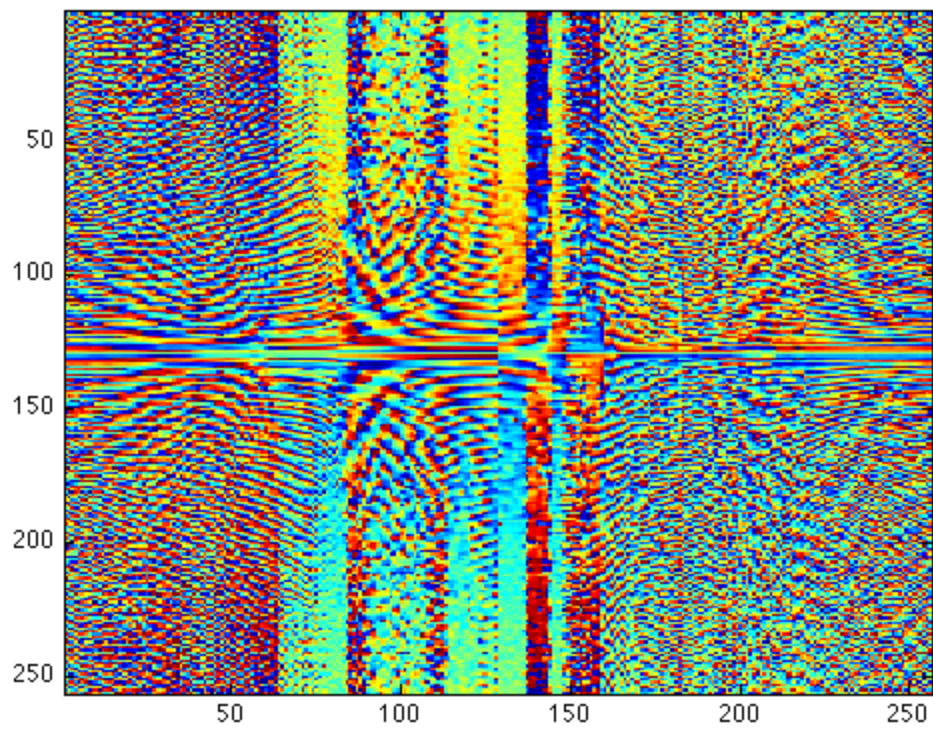


46)

a)

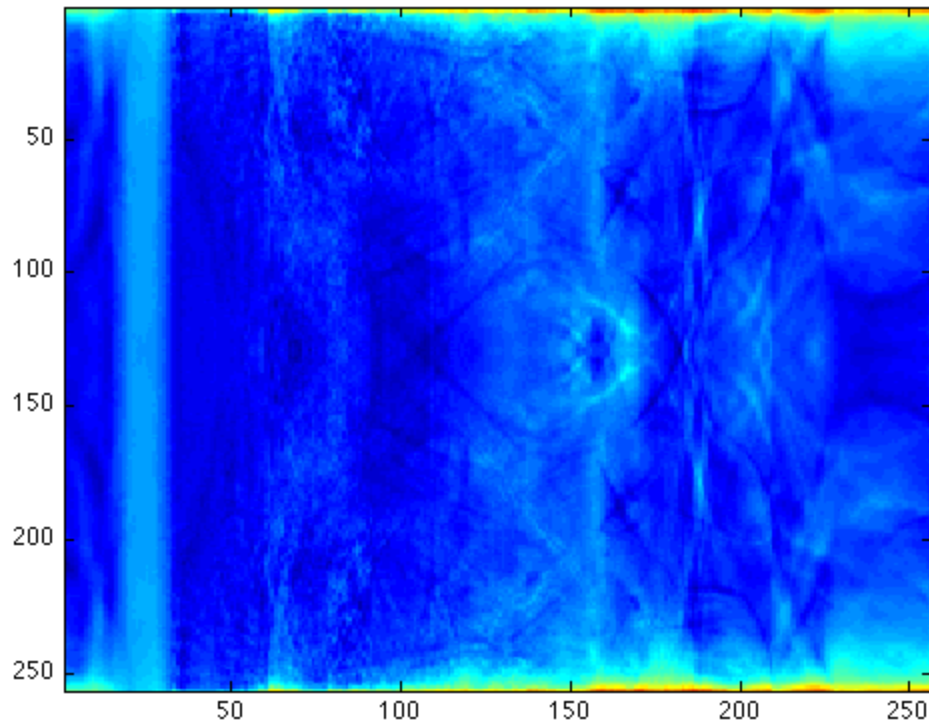
```
z = imread('lena.jpg');  
xf = fft(z);  
xf = fftshift(xf);  
xm = abs(xf);  
xm = log(xm);  
imagesc(xm);  
xp = angle(xf);  
imagesc(xp);
```





b)

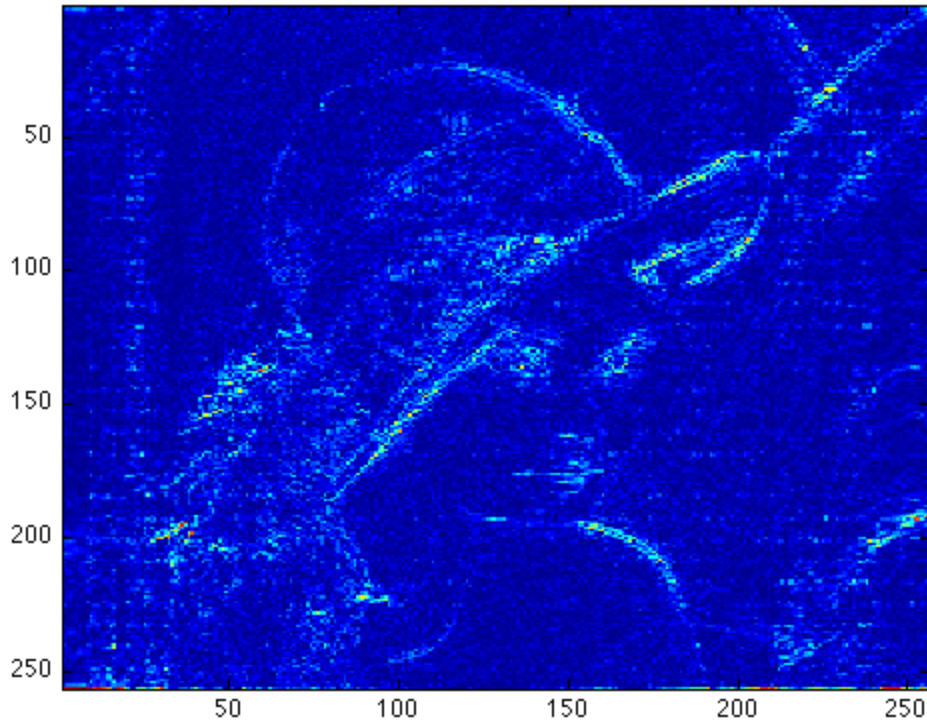
```
xp = zeros(256,256);  
xf = xm.*exp(j*xp);  
xzp = ifft(xf);  
imagesc(xzp);
```



The outline of the image cannot be seen with just the magnitude, but there is color and fine textural variation.

c)

```
for n = 1:256
xm(n,:) = 128;
end
xf = xm.*exp(j*angle(xf));
xcm = ifft(xf);
imagesc(xcm);
```

With just the phase component alone, the color is constant and there is no textural detail, but the basic outline of the image can be seen.