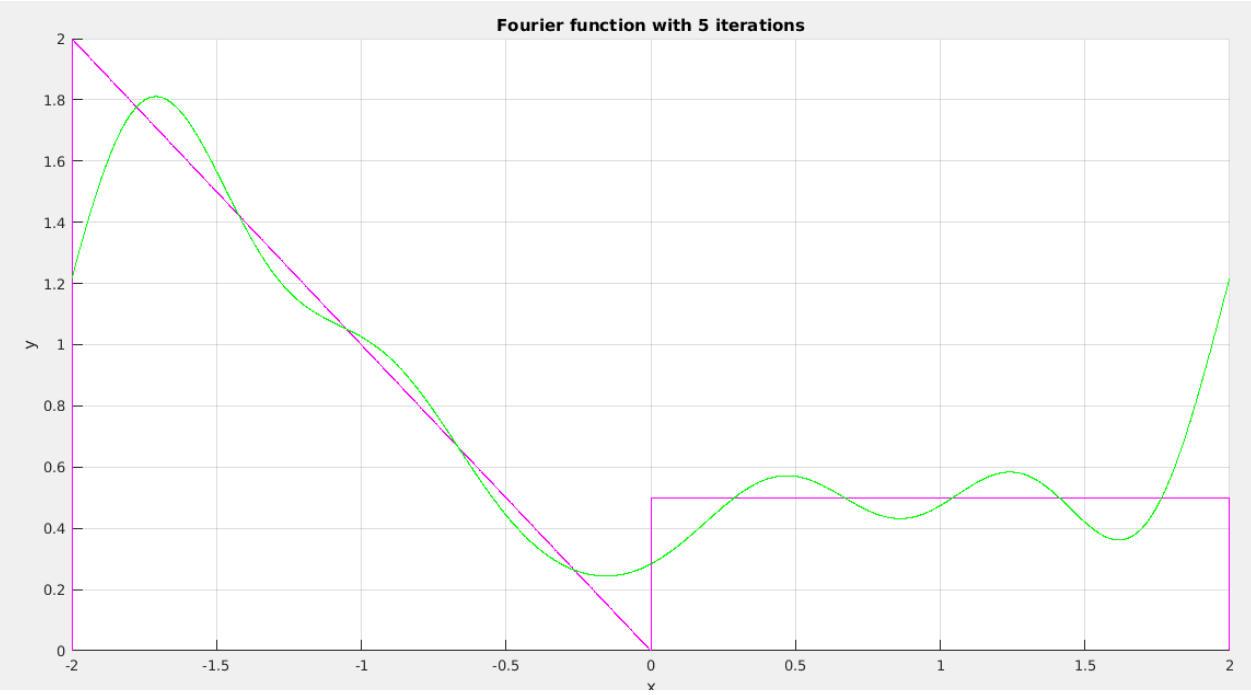
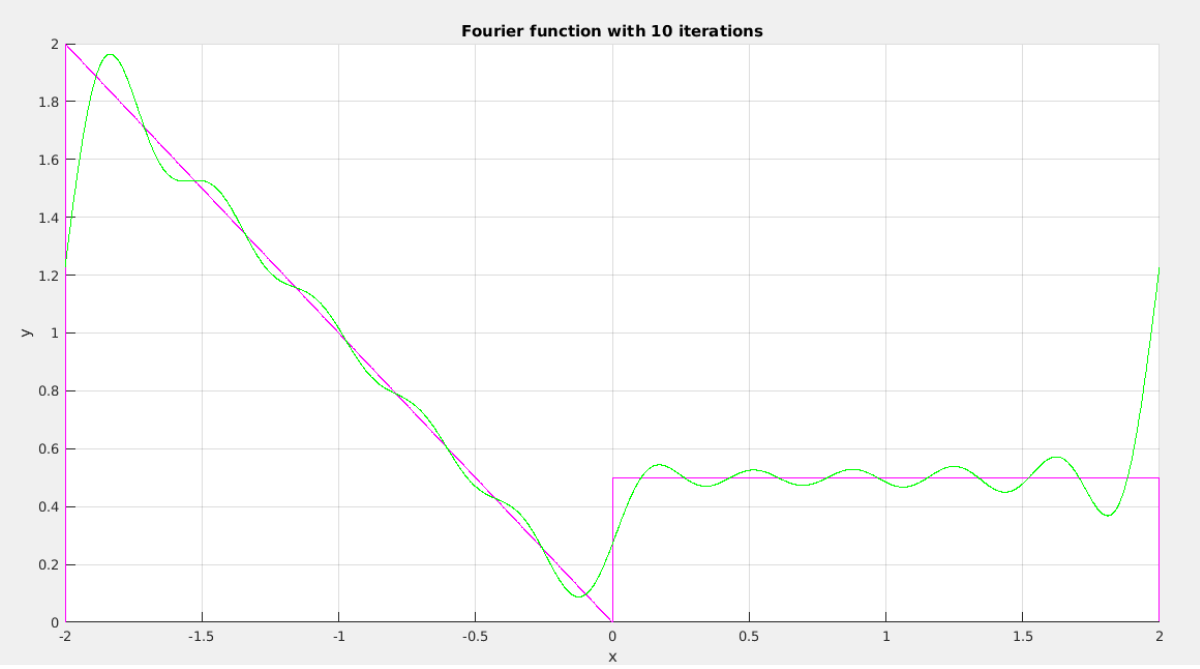
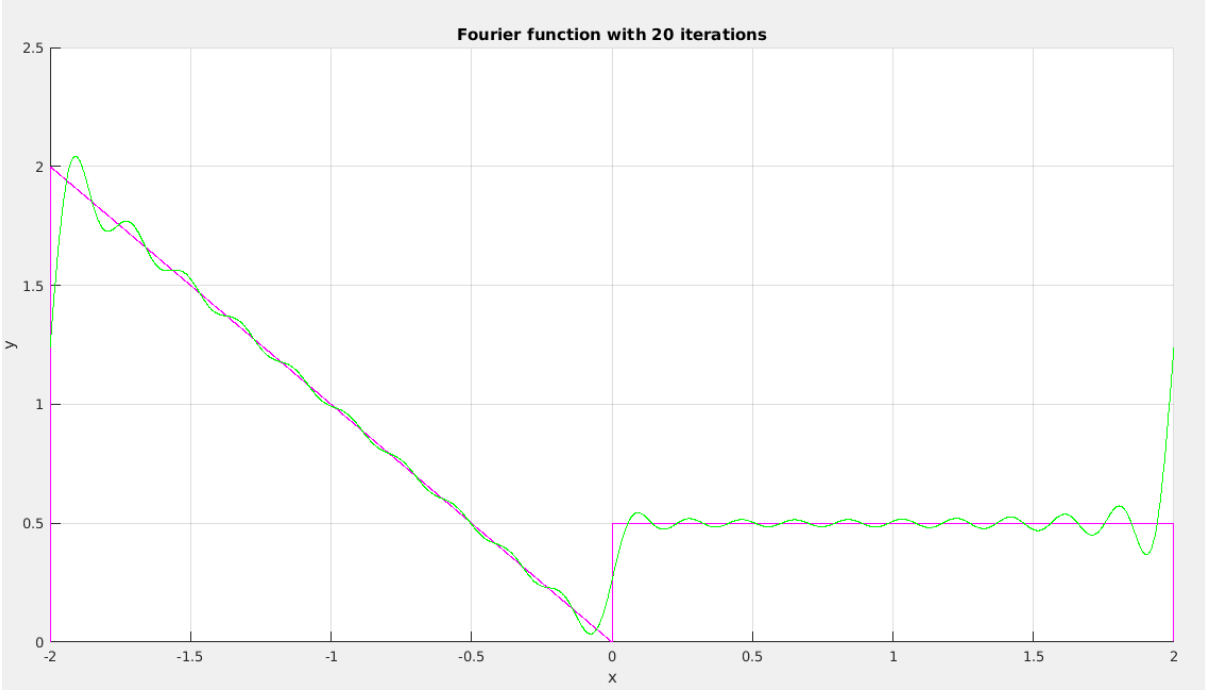
```
close all

iterations  = 5;
period      = 4;
amplitude   = 1;
temporary   = 0;
fourier         = 0;
a0          = 3/4;

angularFrequency = (2 * pi) / period;
xFinal = -2: 0.001 : 2;
xOriginal = -2: 0.001 : 2;

for k = 1: iterations
    ak = ((2*((-1)^(k)-1))/(k*pi)^2);
    bk = (1/2)*(((3*(-1)^(k))+ 1)/(pi*k));

    temporary = temporary + (ak * cos(k*angularFrequency*xFinal) + bk *
sin(k*angularFrequency*xFinal));
end

fourier = a0 + temporary;
funcionOriginal = (((xOriginal > -2) & (xOriginal < 0)).*(-xOriginal) + ((xOriginal > 0)
& (xOriginal < 2)).*(1/2));


figure(1); clf(1)
hold on

plot(xOriginal, funcionOriginal, 'm')
plot(xFinal, fourier, 'g')

xlabel('x')
ylabel('y')
title('Fourier function with 5 iterations')
grid on
```



```
close all

iterations  = 10;
period      = 4;
amplitude   = 1;
temporary   = 0;
fourier         = 0;
a0          = 3/4;

angularFrequency = (2 * pi) / period;
xFinal = -2: 0.001 : 2;
xOriginal = -2: 0.001 : 2;

for k = 1: iterations
    ak = ((2*((-1)^(k)-1))/(k*pi)^2);
    bk = (1/2)*(((3*(-1)^(k))+ 1)/(pi*k));

    temporary = temporary + (ak * cos(k*angularFrequency*xFinal) + bk *
sin(k*angularFrequency*xFinal));
end

fourier = a0 + temporary;
funcionOriginal = (((xOriginal > -2) & (xOriginal < 0)).*(-xOriginal) + ((xOriginal > 0)
& (xOriginal < 2)).*(1/2));


figure(1); clf(1)
hold on

plot(xOriginal, funcionOriginal, 'm')
plot(xFinal, fourier, 'g')

xlabel('x')
ylabel('y')
title('Fourier function with 10 iterations')
grid on
```



```
close all

iterations  = 20;
period      = 4;
amplitude   = 1;
temporary   = 0;
fourier         = 0;
a0          = 3/4;

angularFrequency = (2 * pi) / period;
xFinal = -2: 0.001 : 2;
xOriginal = -2: 0.001 : 2;

for k = 1: iterations
    ak = ((2*((-1)^(k)-1))/(k*pi)^2);
    bk = (1/2)*(((3*(-1)^(k))+ 1)/(pi*k));

    temporary = temporary + (ak * cos(k*angularFrequency*xFinal) + bk *
sin(k*angularFrequency*xFinal));
end

fourier = a0 + temporary;
funcionOriginal = (((xOriginal > -2) & (xOriginal < 0)).*(-xOriginal) + ((xOriginal > 0)
& (xOriginal < 2)).*(1/2));


figure(1); clf(1)
hold on

plot(xOriginal, funcionOriginal, 'm')
plot(xFinal, fourier, 'g')

xlabel('x')
ylabel('y')
title('Fourier function with 20 iterations')
grid on
```



```
close all

iterations  = 12345;
period      = 4;
amplitude   = 1;
temporary   = 0;
fourier         = 0;
a0          = 3/4;

angularFrequency = (2 * pi) / period;
xFinal = -2: 0.001 : 2;
xOriginal = -2: 0.001 : 2;

for k = 1: iterations
    ak = ((2*((-1)^(k)-1))/(k*pi)^2);
    bk = (1/2)*(((3*(-1)^(k))+ 1)/(pi*k));

    temporary = temporary + (ak * cos(k*angularFrequency*xFinal) + bk *
sin(k*angularFrequency*xFinal));
end

fourier = a0 + temporary;
funcionOriginal = (((xOriginal > -2) & (xOriginal < 0)).*(-xOriginal) + ((xOriginal > 0)
& (xOriginal < 2)).*(1/2));


figure(1); clf(1)
hold on

plot(xOriginal, funcionOriginal, 'm')
plot(xFinal, fourier, 'g')

xlabel('x')
ylabel('y')
title('Fourier function with infinite iterations')
grid on
```