```
%clf;

clc;
clear;
lambda = 0.24;
A = 0.44;
P = 1;
W = P / 2;
n = 1000;
nlim = floor(2*A/lambda);
k = nlim;
counter = 0;

while (counter / P *lambda / (2 * A) <= 1)
    counter = counter + 1;
end


stepper = 0:(counter - 1);
R = stepper / P *lambda / (2 * A);

T = 2 / pi * (acos(R) - R.*sqrt(1-R.^2));
%FIG1
figure(1);
%FIG1
clf;
hold on;
grid on;
xlabel('x');
ylabel('I_0');
axis([-P/2 P/2 -0.2 1.2]);
X = -P / 2:P/100:P / 2;
    Y = sin(X*2*pi/P);
    Y(find(Y >= 0)) = 1;
    Y(find(Y < 0)) = 0;
    axis([-P/2 P/2 -0.2 1.2]);
plot(X,Y);
axis([-P/2 P/2 -0.2 1.2]);
filename_fig1 = "fig1-0.pdf";
  print (figure(1), filename_fig1);
a0 = 0.5;
b1 = integral(@(x) 2/P*sin(2*pi*x/P), 0, P/2);

f = cell(k,1);
f{1,1} = @(x) (b1.*sin(2*pi*x/P));


checker = 2;

j = 1;
j_val = [j+1];
while(checker <= k)
  j = j + 1;
  bi = integral(@(x) 2/P*sin(2*pi*j*x/P), 0, P/2);
  if (bi > 10^(-5))
    f{checker,1} = @(x) (bi*sin(2*pi*j*x/P));
    checker = checker + 1;
    j_val = [j_val j+1];
  else
    continue
  end
end
%FIG1
figure(1);
%FIG1
xlabel('x');
ylabel('I_0');

sum_func = @(x) 0;
```

```
for i = 1:k
  hold on;
  grid on;
  buf = @(x) f{i}(x);
  sum_func = @(x) sum_func(x) + buf(x);
  plot(X, (buf(X) + a0));
  filename_fig = strcat("fig1-", int2str(i));
  filename_fig1 = strcat(filename_fig,".pdf");
  print (figure(1), filename_fig1);
  pause(0.5);
end

plot(X, sum_func(X)+a0);

filename_fig = strcat("fig1-", int2str(k+1));
filename_fig1 = strcat(filename_fig, ".pdf");
print (figure(1), filename_fig1);

%FIG2
figure(2);
%FIG2

fsum = @(x) a0;
if (counter > k)
  ki = k;
else
  ki = counter - 1;
end
    clf;
for i = 1:k
    hold on;
    grid on;
    xlabel('x');
    ylabel( '$I_0');
    Y = sin(X*2*pi/P);
    Y(find(Y >= 0)) = 1;
    Y(find(Y < 0)) = 0;
    axis([-P/2 P/2 0 1.2]);
    plot(X,Y);
    fsum = @(x) fsum(x) + T(i+1)*f{i}(x);
    axis([-P/2 P/2 0 1.2]);
    plot (X,fsum(X));
    filename_fig = strcat("fig2-",int2str(i));
    filename_fig2 = strcat(filename_fig, ".pdf");
    print (figure(2), filename_fig2);
    pause(0.5);
end

fprintf("Max contrast = %d\n", max(fsum(X)));
fprintf("Min contrast = %d\n", min(fsum(X)));
contrast_ratio = (max(fsum(X)) - min(fsum(X))) / (max(fsum(X)) + min(fsum(X)));
fprintf("Contrast ratio = %d\n", contrast_ratio);


%FIG3
figure(3);
%FIG3
clf;
grid on;
plot(R,T);
grid on;
xlabel('R');
ylabel('T');
axis([0 0.8 0 1]);
filename_fig3 = "fpm.pdf";
print (figure(3), filename_fig3);


```