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```
clc, close all, clear all

p1 = 98;
t1 = 60;
t1_k = 273 + t1;
r_c = 5:0.5:25;%9.5;
k = 1.35;
HV = 43000;
Cv = 0.821;
eta_c = 0.96;
AF = 15.5;
R = 0.287;

% 1 to 2
t2_k = t1_k * (r_c).^(k - 1);
t2 = t2_k - 273;

p2 = p1 * (r_c).^(k);

% 2 to 3
t3_k = ((HV*eta_c) / ((AF+1)*Cv)) + t2_k;
t3 = t3_k - 273;
p3 = p2 * (t3_k/t2_k);
% 3 to 4
t4_k = t3_k .* ((r_c).^(-1)).^(k - 1);
t4 = t4_k - 273;

p4 = p3 .* ((r_c).^(-1)).^(k);

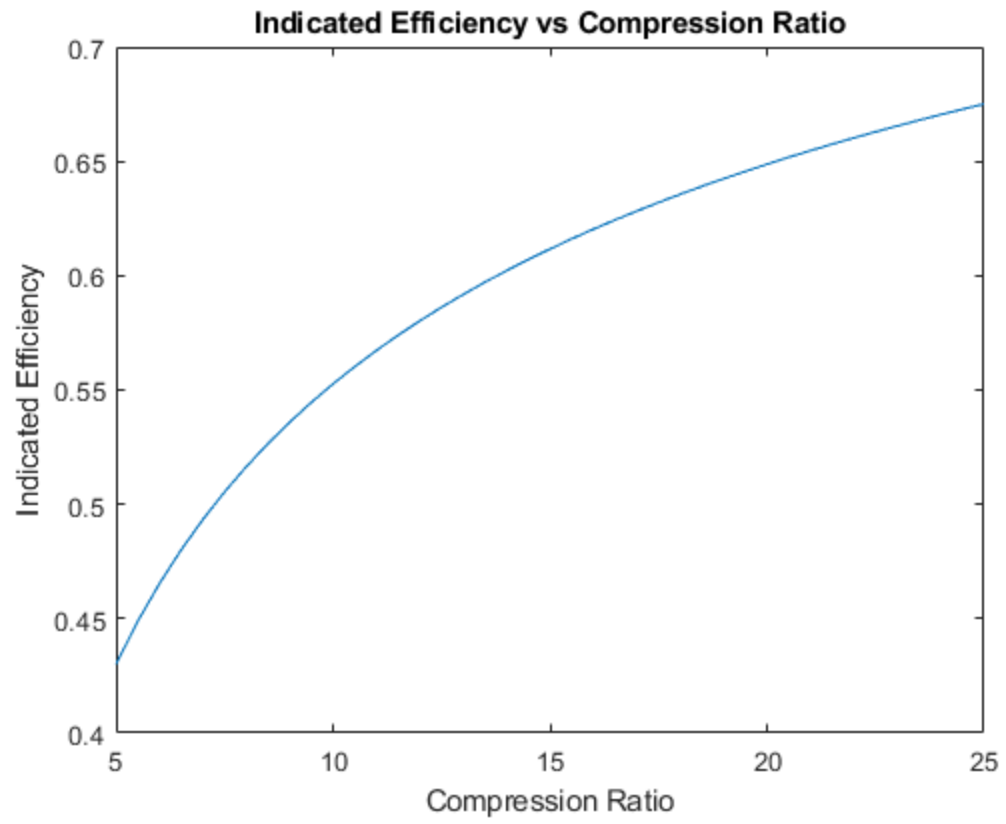
% net work
w3_4 = R * ((t4_k - t3_k)/(1-k));
w1_2 = R * ((t2_k - t1_k)/(1-k));
w_net = w3_4 + w1_2;

%Heat Addition
qin = Cv*(t3_k - t2_k);
%heat loss
qout = Cv*(t4_k - t1_k);

%efficiency
eta = w_net./qin;

plot(r_c, eta)
title('Indicated Efficiency vs Compression Ratio')
ylabel('Indicated Efficiency')
xlabel('Compression Ratio')
```

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