```matlab
%%Task Set A

%Problem 4e (varring T0)
M0 = 75;
t0 = 0;
k = 0.25;
T01 = 50;
T02 = 80;
t=0:.1:24;
T1= M0+(T01 - M0).*exp(k.*(t0 - t));
T2= M0+(T02 - M0).*exp(k.*(t0 - t));
T=M0+t*0;

figure(1)
hold on
plot(t,T1,'red')
plot(t,T2,'blue')
plot(t,T,'--','Color','black')
title('Temperature over time varying intitial temperature')
xlabel('Time (hr)','FontSize',16)
ylabel('Temperature (°F)','FontSize',16)
legend('T_0 = 50','T_0 = 80','M_0 = 75 ')
xticks(0:4:24)
xlim([0 24])
grid on
grid minor
hold off


%Problem 4f (varring T0)
M0 = 75;
t0 = 0;
k1 = 1;
k2 = .5;
k3 = .25;
T0 = 50;

t=0:.1:24;
T1 = M0+(T0 - M0).*exp(k1.*(t0 - t));
T2 = M0+(T0 - M0).*exp(k2.*(t0 - t));
T3 = M0+(T0 - M0).*exp(k3.*(t0 - t));
T = M0+t*0;

figure(2)
hold on
plot(t,T1,'red')
plot(t,T2,'blue')
plot(t,T3,'green')
plot(t,T,'--','Color','black')
title('Temperature over time varying \kappa')
xlabel('Time (hr)','FontSize',16)
ylabel('Temperature (°F)','FontSize',16)
```
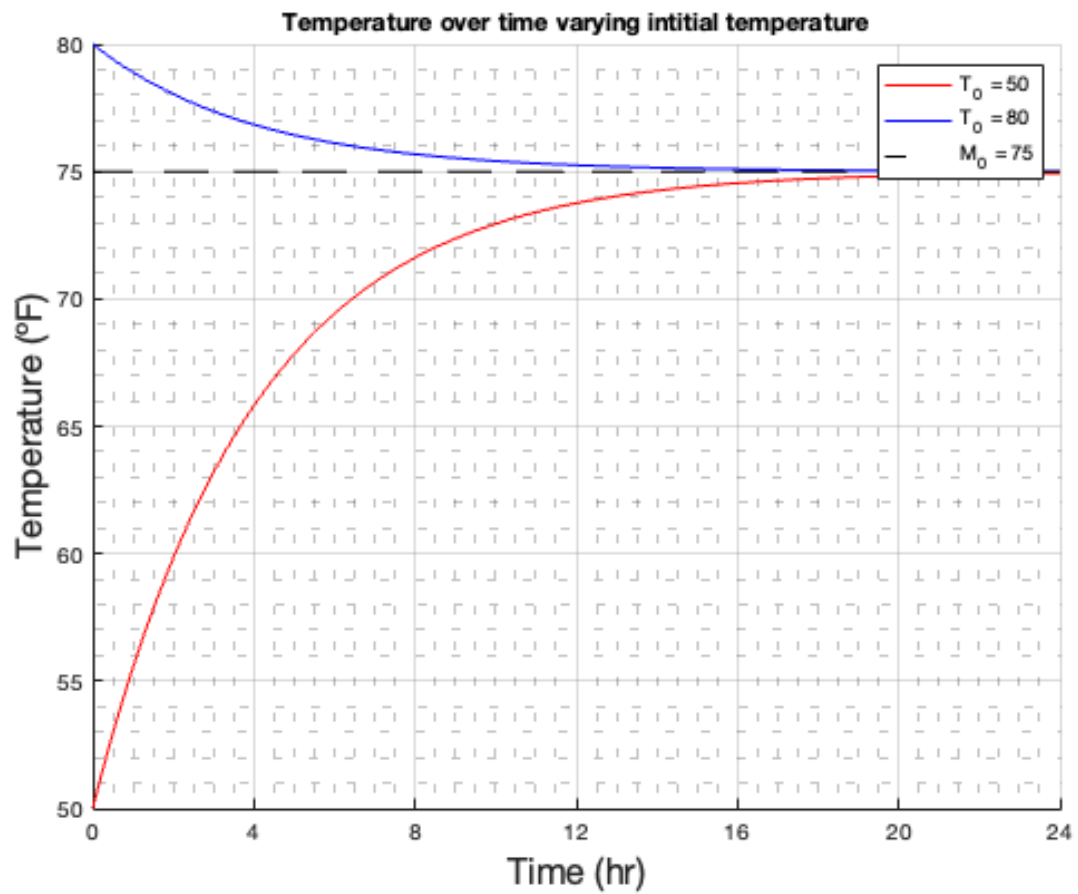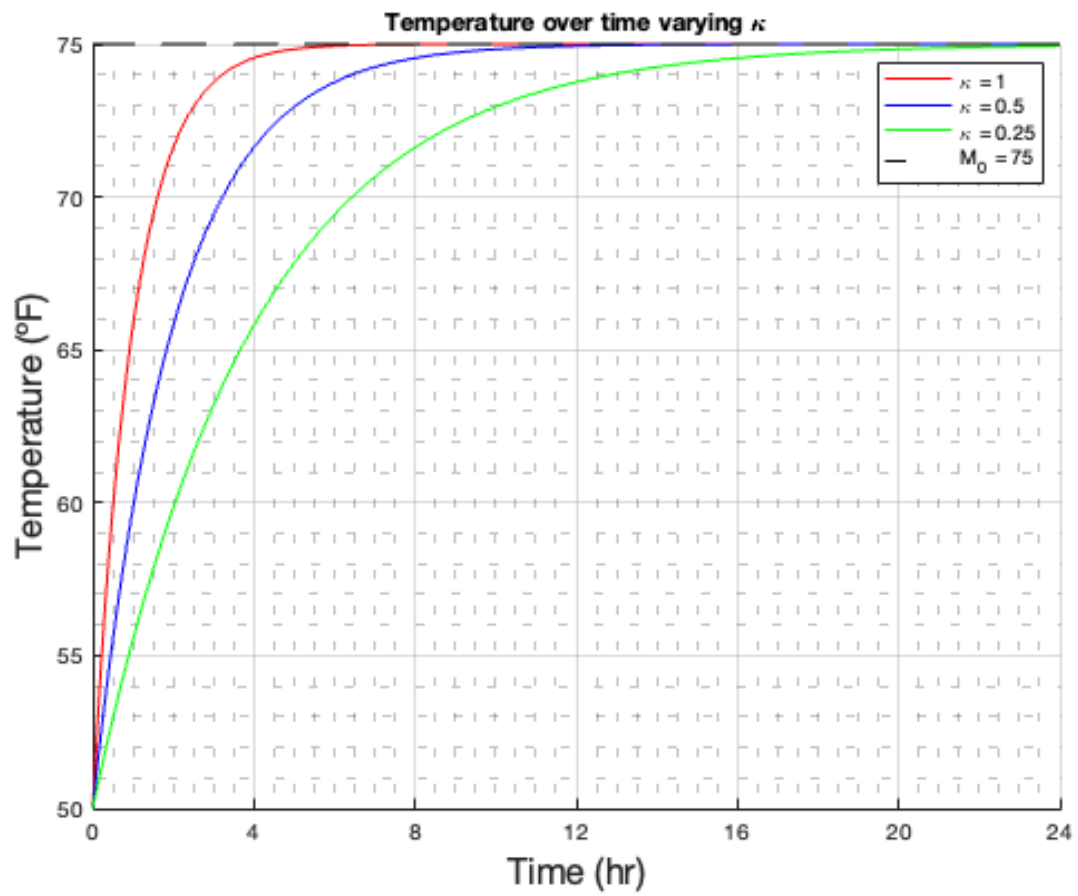
```
legend('\kappa = 1','\kappa = 0.5','\kappa = 0.25','M_0 = 75')
xticks(0:4:24)
xlim([0 24])
grid on
grid minor
hold off
```


Temperature over time varying intitial temperature

Temperature over time varying κ

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