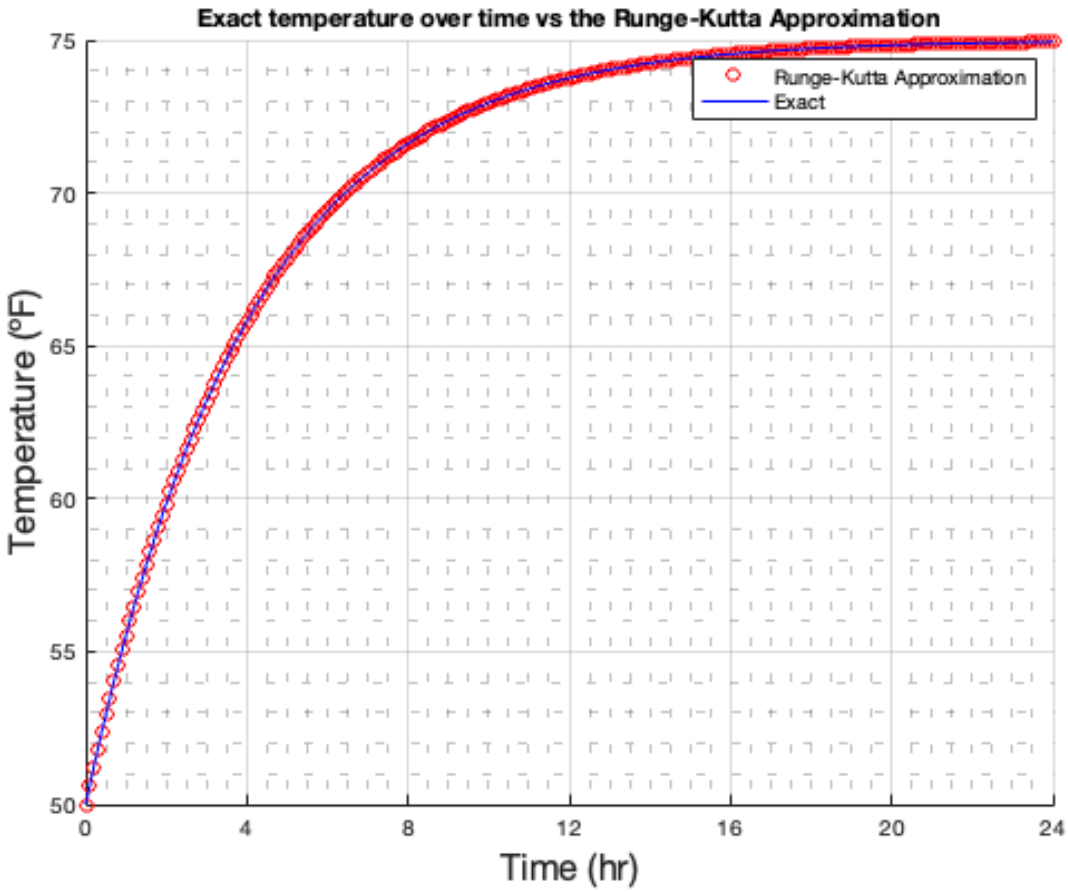
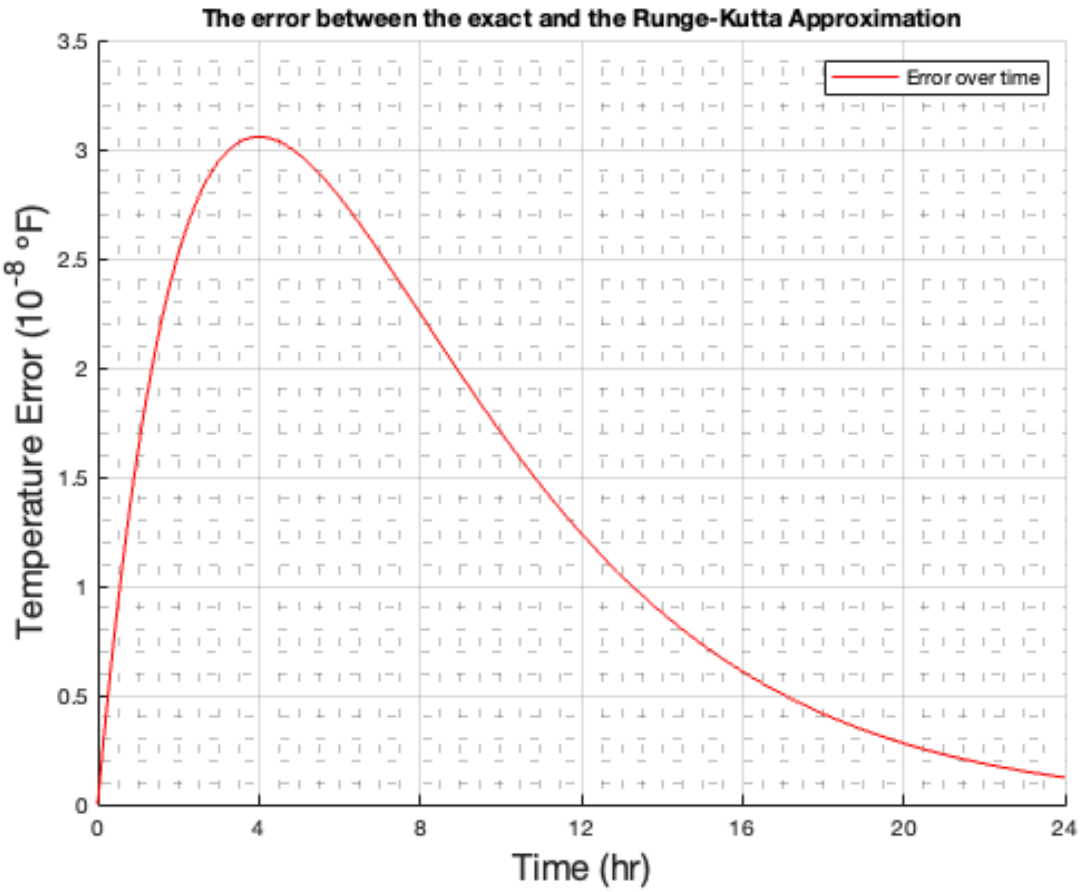
```
%3 Task set B


%from 2.4e
M0 = 75;
t0 = 0;
k = 0.25;
T01 = 50;

t1=0:.1:24;
T1= M0+(T01 - M0).*exp(k.*(t0 - t1));
%T=M0+t*0;

%3
ti=0;
tf=24;
npts=240;
T0=50;

[out1,out2]=rk4(ti,tf,npts,T0,@differential);


%exact vs RK plot
figure(1);
hold on
plot(out1,out2,'o','Color','red');
plot(t1,T1,'Blue')
title('Exact temperature over time vs the Runge-Kutta Approximation')
xlabel('Time (hr)','FontSize',16)
ylabel('Temperature (°F)','FontSize',16)
legend('Runge-Kutta Approximation','Exact')
xticks(0:4:24)
xlim([0 24])
grid on
grid minor
hold off



%Task Set B,
% error
error = abs(T1-out2);
figure (2)
hold on
plot(t1,error*10^8,'red')
title('The error between the exact and the Runge-Kutta Approximation')
xlabel('Time (hr)','FontSize',16)
ylabel('Temperature Error (10^-^8 °F)','FontSize',16)
legend('Error over time')
xticks(0:4:24)
xlim([0 24])
grid on
```

```
grid minor
hold off


function f = differential(t,T);
f=0*t+0.25*(75-T);
end
```





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