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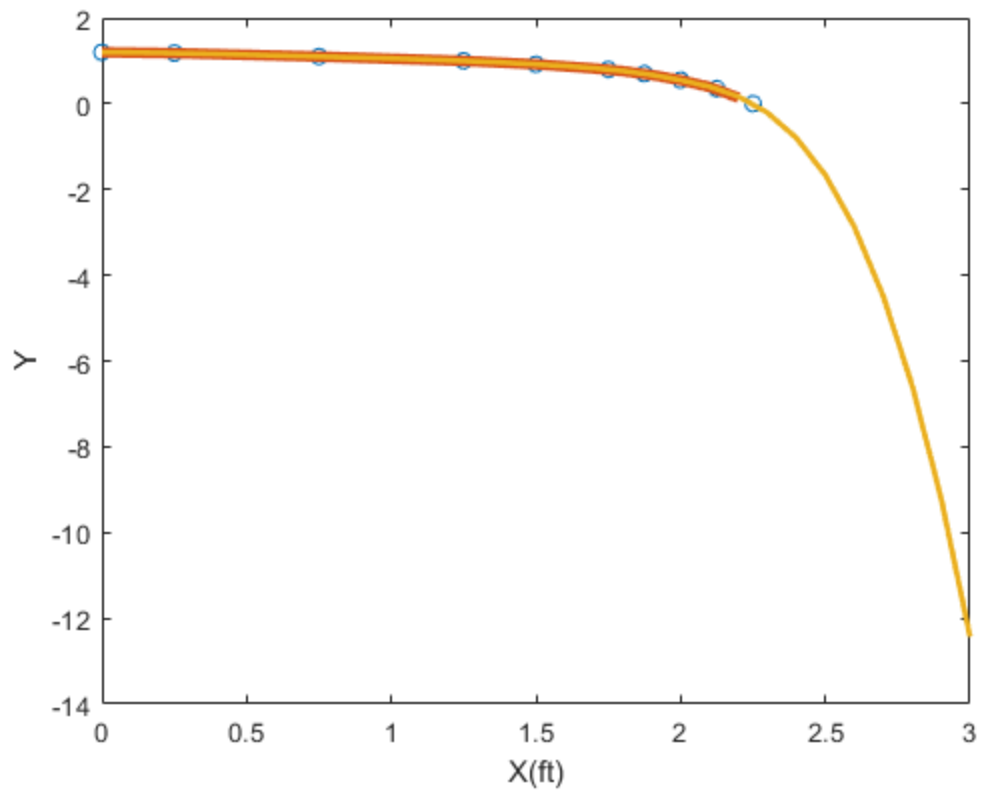
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```
clear;clc;
```

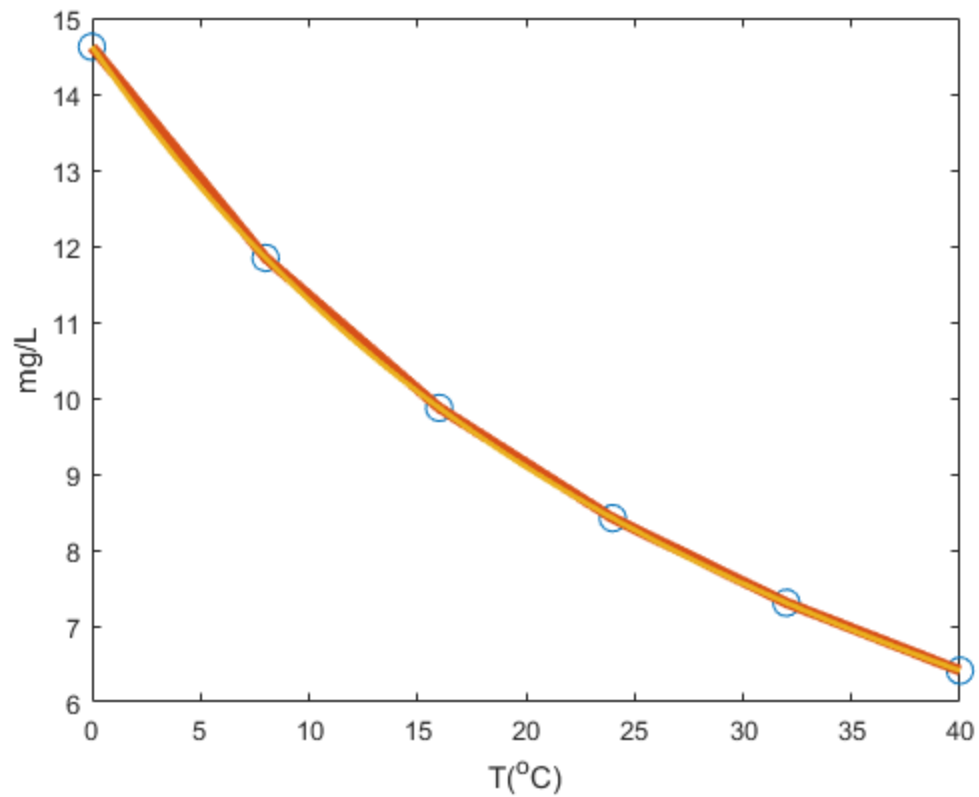
Problem 1:

```
clear;clc;
% load parameter
X = [0 0.25 0.75 1.25 1.5 1.75 1.875 2 2.125 2.25];
Y = [1.2 1.18 1.1 1 0.92 0.8 0.7 0.55 0.35 0];
% plot original data
figure(1);
plot(X,Y,'o');
hold on
xlabel('X(ft)');
ylabel('Y');
% interpolation
plotvals=0:0.1:3;
yvals=interp1(X,Y,plotvals,'linear');
plot(plotvals,yvals,'LineWidth',4);
hold on
yvals=interp1(X,Y,plotvals,'spline');
plot(plotvals,yvals,'LineWidth',2);
hold on
```



Problem 2:

```
clear;clc;
T = 0:8:40;
% load original data
o = [14.621 11.843 9.870 8.418 7.305 6.413];
figure(2);
plot(T,o, 'o', 'MarkerSize',10);
xlabel('T(^oC)');
ylabel('mg/L');
hold on
plotvals=0:0.1:40;
% interpolation
yvals=interp1(T,o,plotvals, 'linear');
plot(plotvals,yvals, 'LineWidth',4);
hold on
yvals=interp1(T,o,plotvals, 'spline');
plot(plotvals,yvals, 'LineWidth',2);
hold on
```



Problem 3

```
clear;clc;
% load function
f = @(t) (sin(t)).^2;
t = 0:pi/4:2*pi;
% plot original data
figure(3);
plot(t,f(t),'o','MarkerSize',10);
xlabel('t');
ylabel('f(t)');
hold on
%fit

p=polyfit(t,f(t),7);
P =
    p(1)*t.^7+p(2)*t.^6+p(3)*t.^5+p(4)*t.^4+p(5)*t.^3+p(6)*t.^2+p(7)*t.^1+p(8);
plot(t,P);
hold on;
% interpolation
plotvals=0:0.1:2*pi

yvals=interp1(t,f(t),plotvals,'spline');
plot(plotvals,yvals,'LineWidth',2);
hold on
```

`plotvals =`

`# 1 # 7`

`0 0.1000 0.2000 0.3000 0.4000 0.5000 0.6000`

`# 8 # 14`

`0.7000 0.8000 0.9000 1.0000 1.1000 1.2000 1.3000`

`# 15 # 21`

`1.4000 1.5000 1.6000 1.7000 1.8000 1.9000 2.0000`

`# 22 # 28`

`2.1000 2.2000 2.3000 2.4000 2.5000 2.6000 2.7000`

`# 29 # 35`

`2.8000 2.9000 3.0000 3.1000 3.2000 3.3000 3.4000`

`# 36 # 42`

`3.5000 3.6000 3.7000 3.8000 3.9000 4.0000 4.1000`

`# 43 # 49`

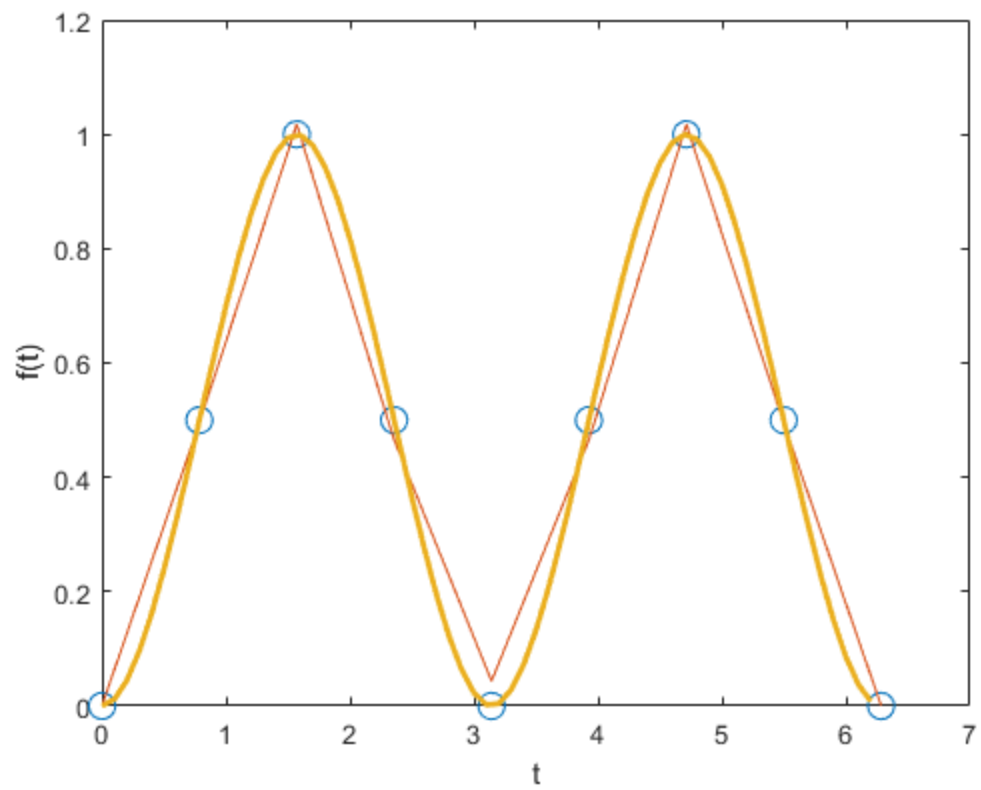
`4.2000 4.3000 4.4000 4.5000 4.6000 4.7000 4.8000`

`# 50 # 56`

`4.9000 5.0000 5.1000 5.2000 5.3000 5.4000 5.5000`

`# 57 # 63`

`5.6000 5.7000 5.8000 5.9000 6.0000 6.1000 6.2000`



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