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Problem 1

```
type quadfit % prints out code for function quadfit
```

```
function [N, XT, D, YT, beta_est, Y_est] = quadfit(X, Y)
N = length(X);
XT = X';
D = [ones(N,1), XT, XT.^2];
YT = Y';
beta_est = (D'*D)^-1*(D'*YT);
Y_est = D*beta_est;
end
```

Problem 2

```
load 'pts_setA(1).mat'
X = ptsMixA(1,:); % setting X
Y = ptsMixA(2,:); % setting Y
```

Problem 3

```
[N, XT, D, YT, beta_est, Y_est] = quadfit(X, Y); % running quadfit
```

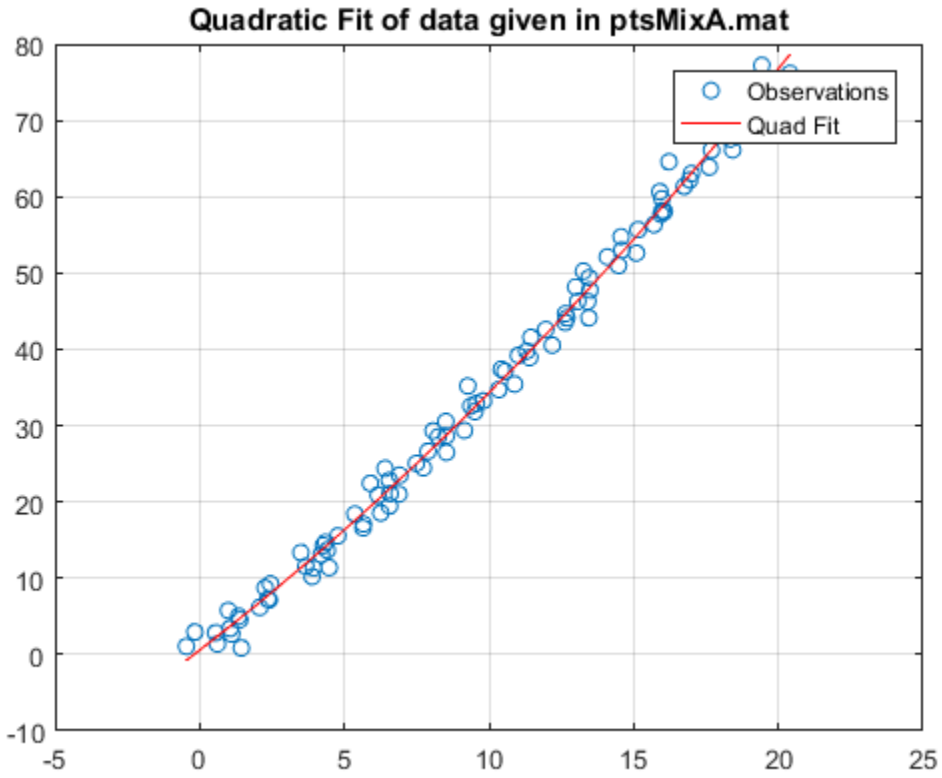
Problem 4

```
%{
Calculated in quadfit printed above
%}
```

Problem 5

```
plot(X, Y, 'o'), hold on, grid on % plotting data points of
 pts_setA(1)
```

```
plot(X, Y_est, 'r') % plotting line of best fit
legend('Observations','Quad Fit') % labeling legend
title('Quadratic Fit of data given in ptsMixA.mat') % labeling title
```



Problem 6

```
err = YT - Y_est; % calculating error of each Y value
RMSEQ = (err'*err/N)^0.5 % calculating RMS error
```

```
RMSEQ =

    1.7071
```

Problem 7

```
[N, XT, D, YT, beta_est, Y_est] = linefit(X, Y); % running linefit
err = YT - Y_est; % calculating error of each Y value
RMSEL = (err'*err/N)^0.5 % calculating RMS error
%{
Quadratic fit is better than linear estimate. The RMS error of the
 quadrtic
fit (RMSEQ) is less than that of the linear estimate (RMSEL). This
 inicates
```

```
that the quadratic fit is better in reference with the data.
%}
```

```
RMSEL =

    2.1784
```

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