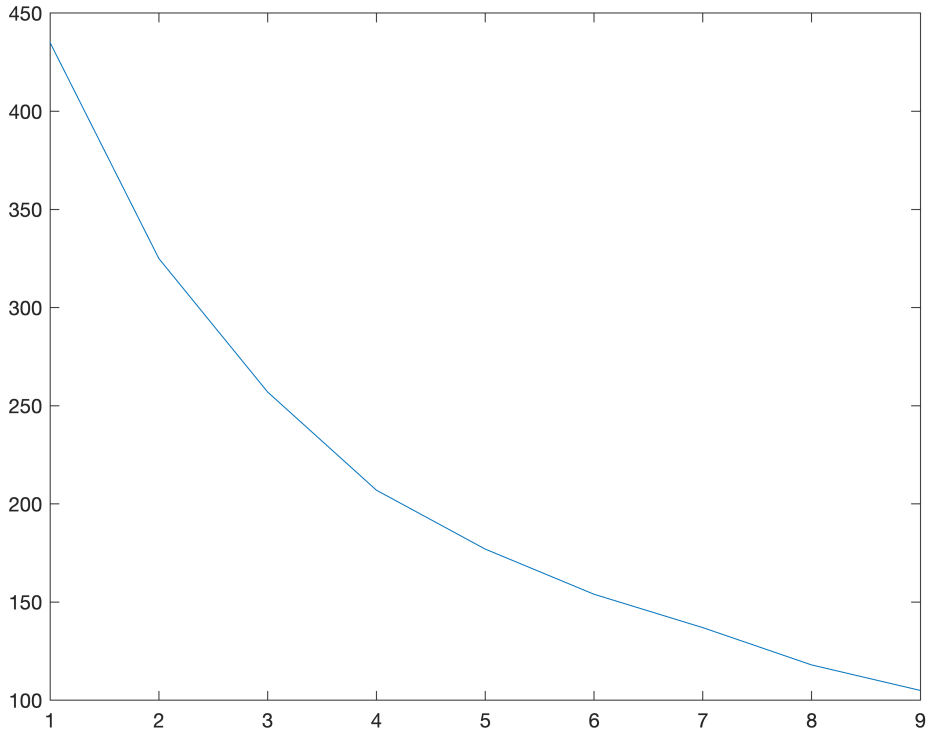
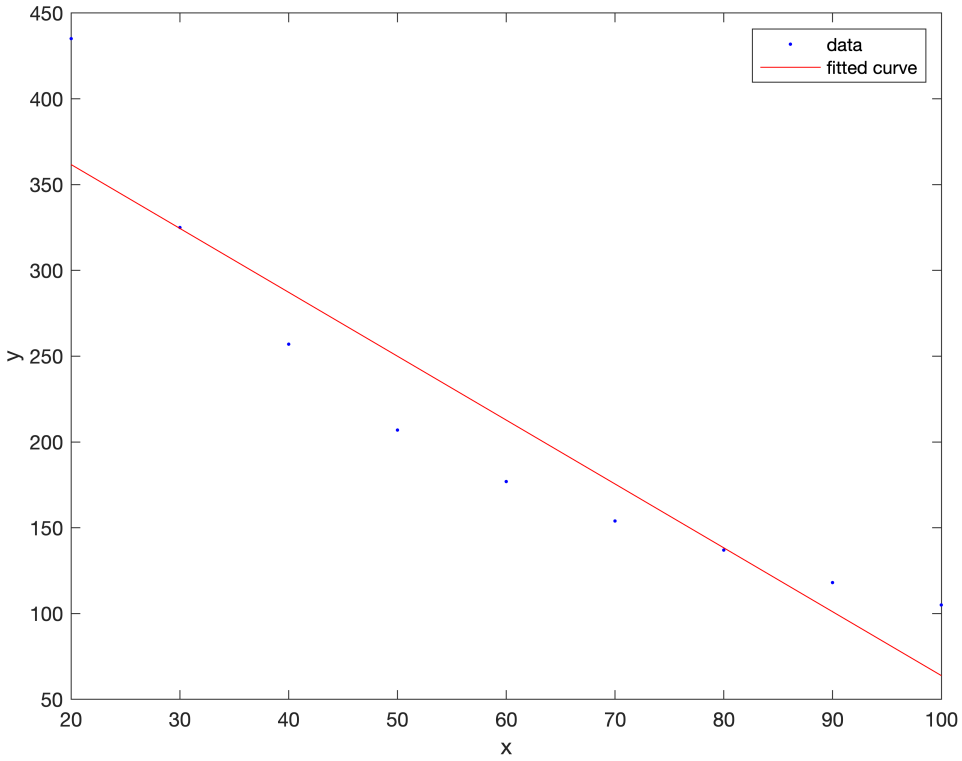
# Calibration Curve

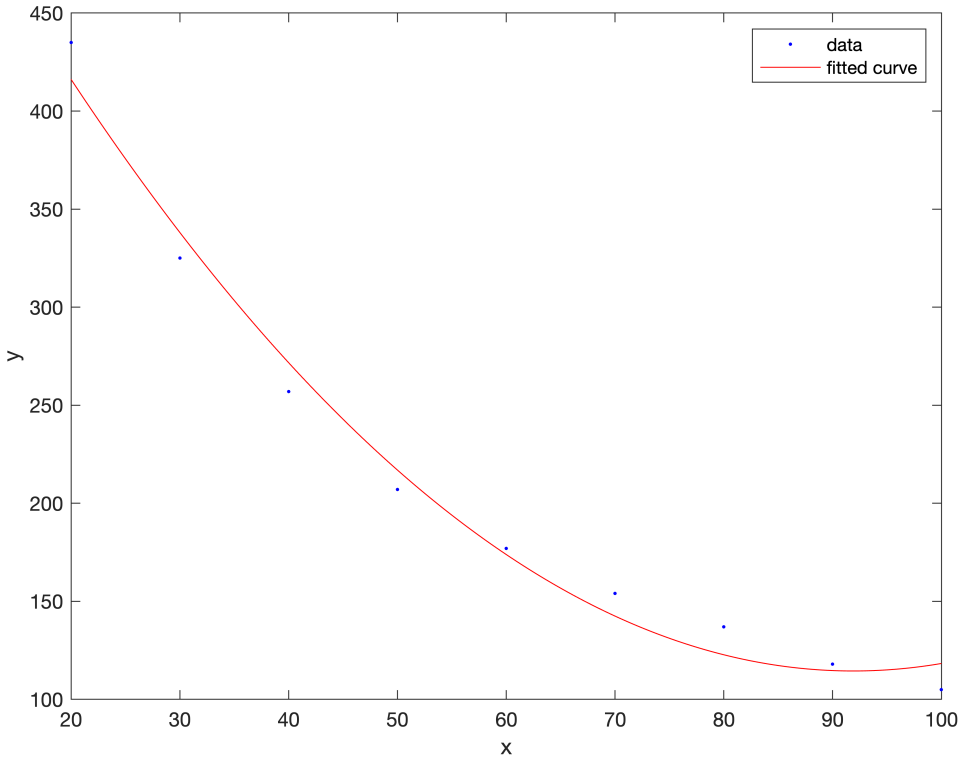
```
% Data measured
distances_cali = [20 30 40 50 60 70 80 90 100]';
measured_cali = [435 325 257 207 177 154 137 118
plot(measured_cali)
```



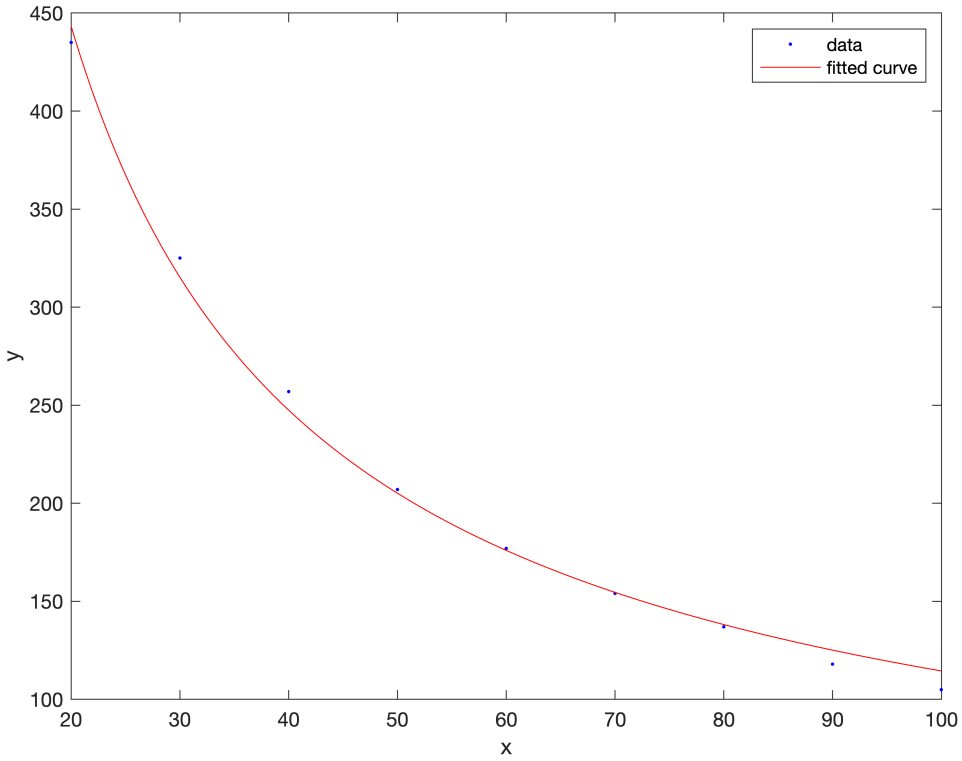

```
% Curve fitting - Linear
[f, gof] = fit(distances_cali,measured_cali,'po
plot(f,distances_cali,measured_cali); % R-Sqaure
```




```
% Curve fitting - Polynomial
[f, gof] = fit(distances_cali,measured_cali,'po
plot(f,distances_cali,measured_cali); % R-Sqaure
```




```
% Curve fitting - Power (Best Option)
[f, gof] = fit(distances_cali,measured_cali,'pow
plot(f,distances_cali,measured_cali); % R-Sqaure
```




```
% Equation -> f(x) = a*x^b
a = 5513;
b = -0.8413;
```

## Error Plot

```
clear figure

distances_error = [25 35 45 55 65 75 85 95 105]
measured_error = [430 325 257 207 177 154 137 11

calculated_error = a*distances_error.^b;
error = measured_error - calculated_error;
```

```
x = 20:10:100;
f = a*x.^b;

hold on
errorbar(x,f,error', 'o');
title('Error Plot of 3D Scanner')
xlabel('Distance (cm)')
ylabel('IR Analog Sensor Value')
hold off
```