

Polynomial Regression

Types of Regressions:

- ▶ Simple Linear Regression

$$y = a_0 + a_1x_1$$

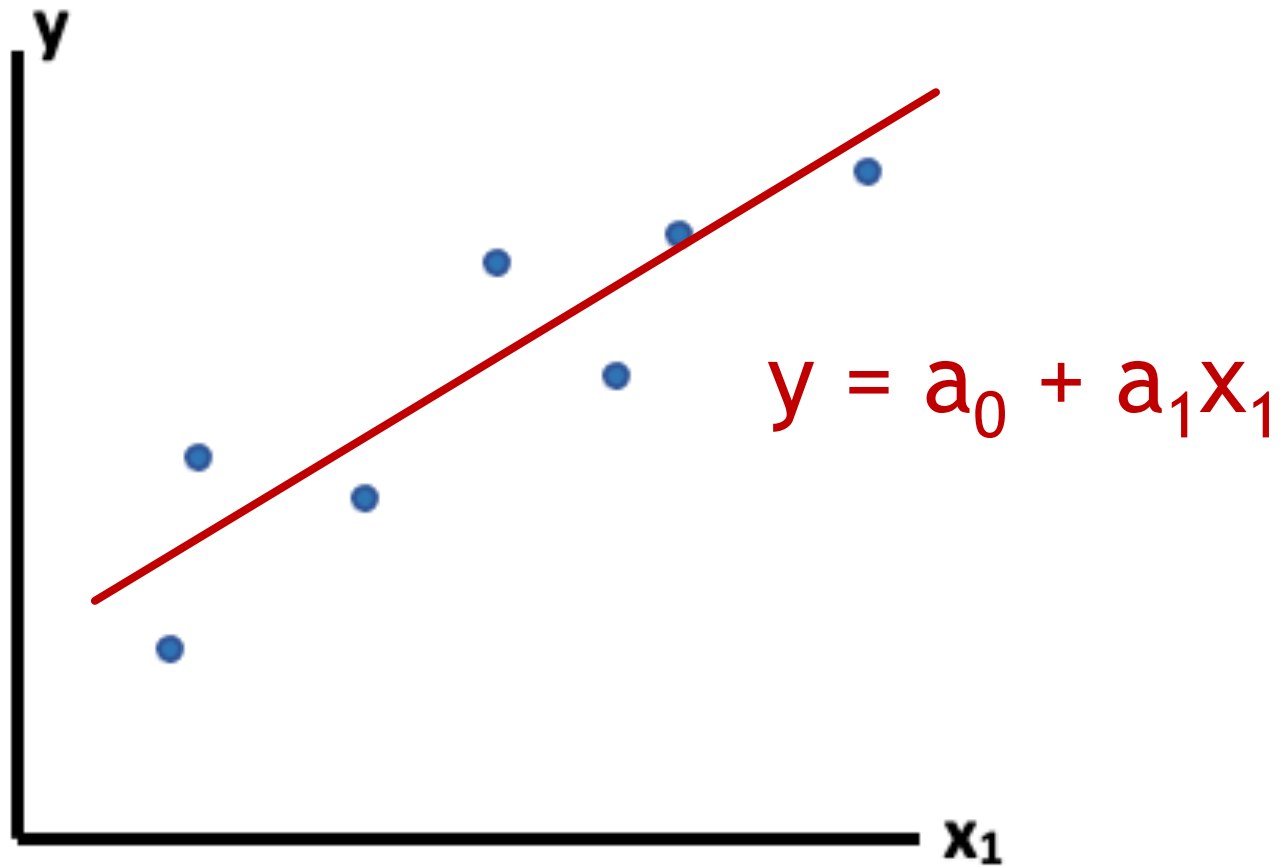
- ▶ Multiple Linear Regression

$$y = a_0 + a_1x_1 + a_2x_2 + \dots + a_nx_n$$

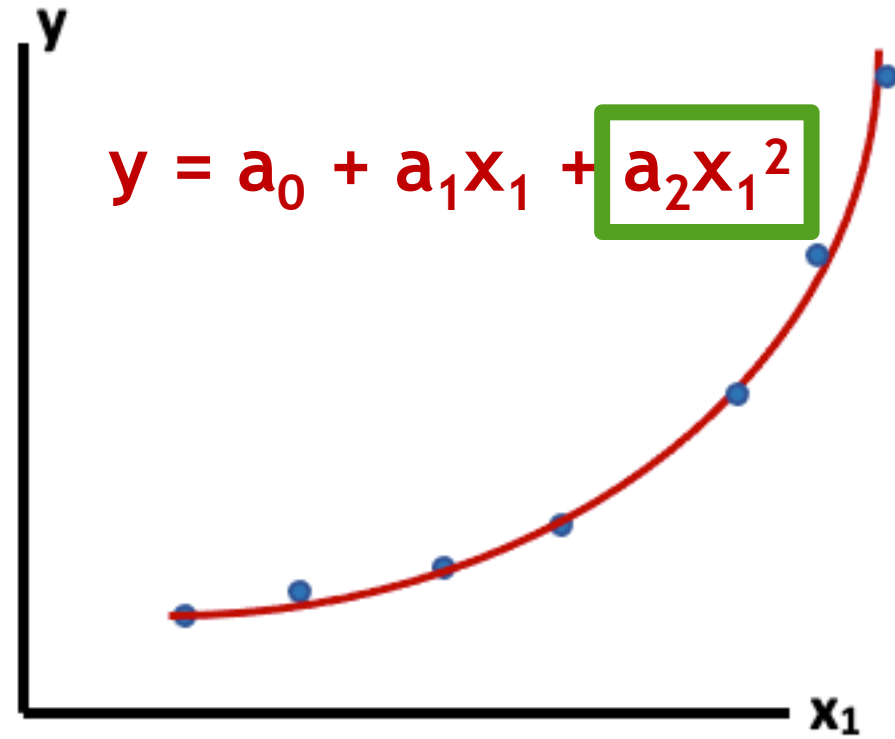
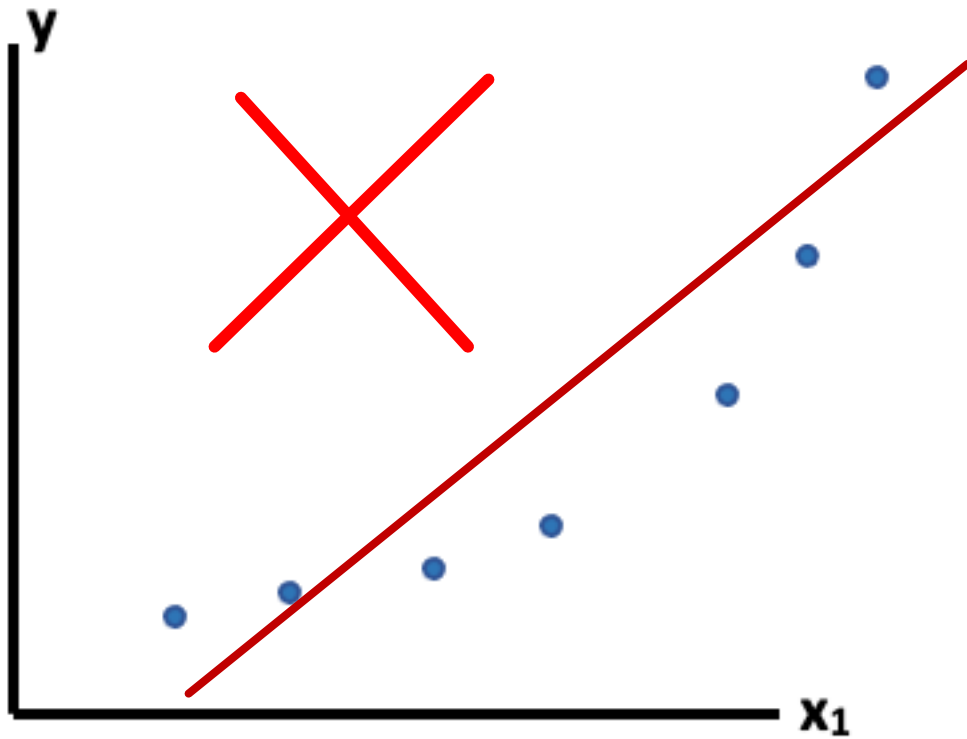
- ▶ Polynomial Linear Regression

$$y = a_0 + a_1x_1 + a_2x_1^2 + \dots + a_nx_1^n$$

Simple linear Regression



Simple Linear Regression



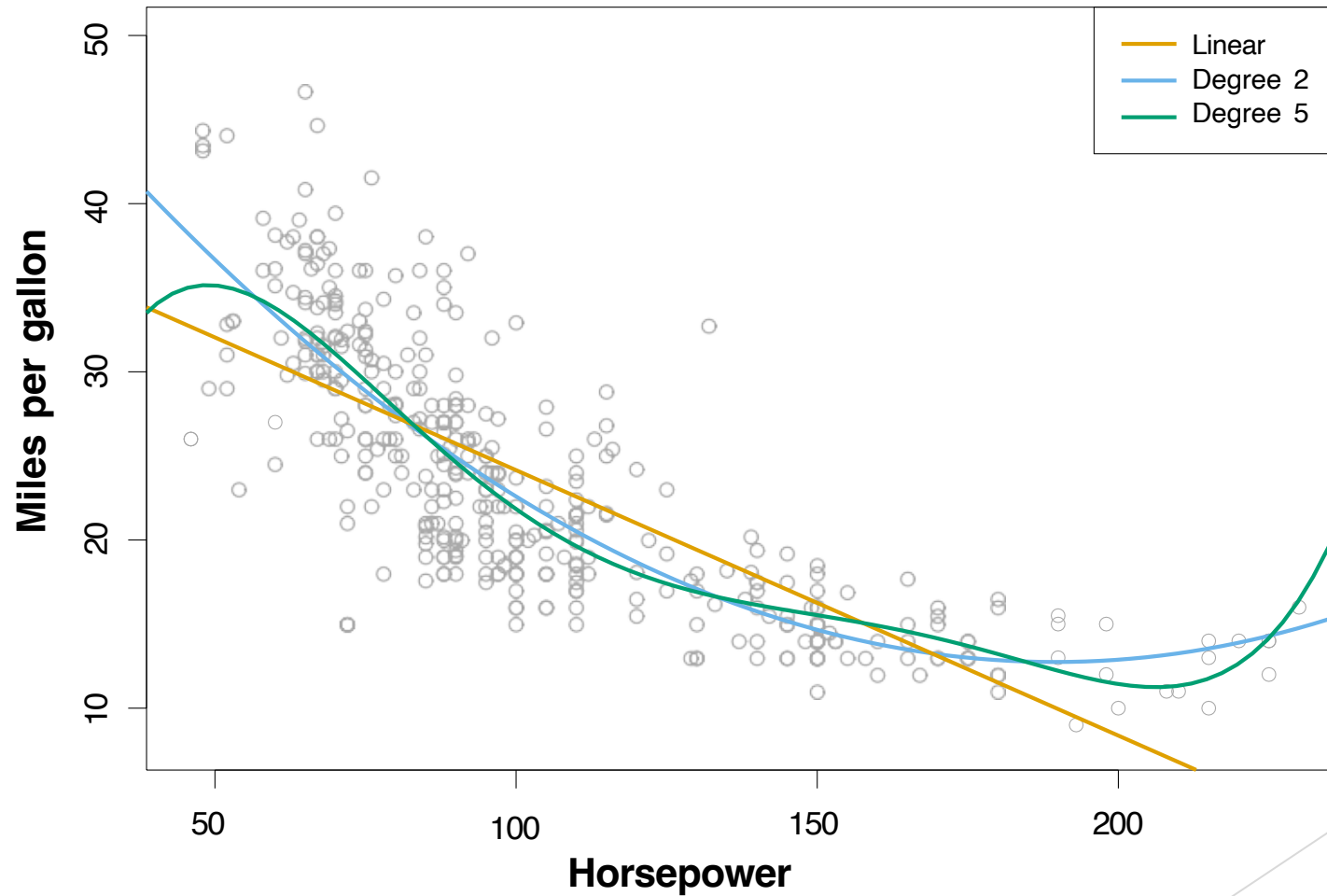
Polynomial Regression

► Why do we call it linear?

$$y = a_0 + a_1x_1 + a_2x_1^2 + \dots + a_nx_1^n$$

Polynomial Regression

polynomial regression on **Auto** data



Polynomial Regression

The figure suggests that

$$\text{mpg} = \beta_0 + \beta_1 \times \text{horsepower} + \beta_2 \times \text{horsepower}^2$$

may provide a better fit.