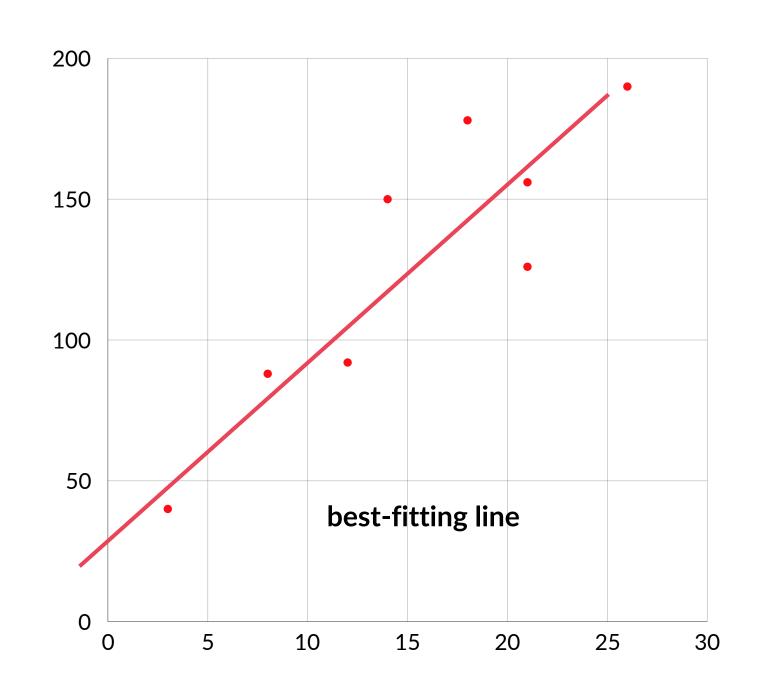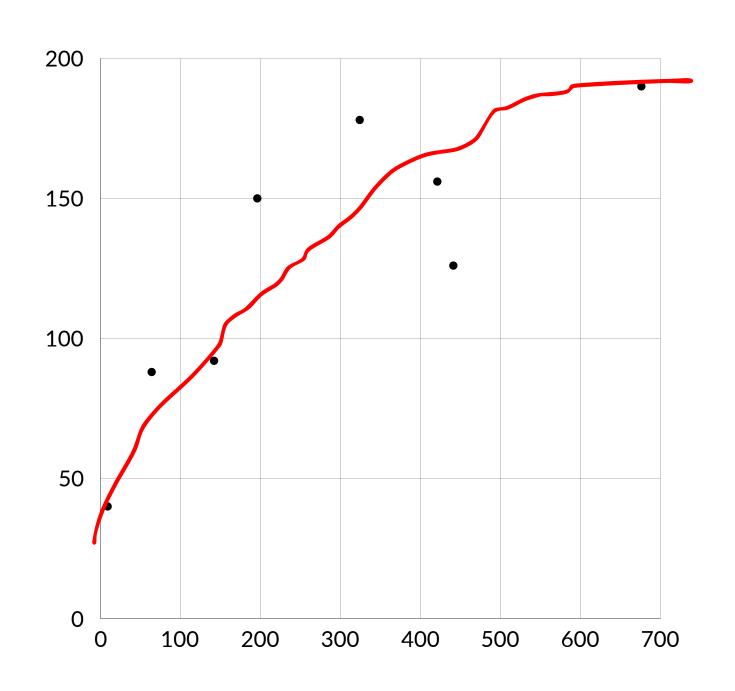# Polynomial Regression

Polynomial Linear Regression

best-fitting line

$$y = \beta_0 + \beta_1 x + \beta_2 x^2 + \beta_3 x^3 + \cdots + \beta_p x^p + \epsilon$$

Degree 1: $$y = \beta_0 + \beta_1 x + \epsilon$$

Degree 2: $$y = \beta_0 + \beta_1 x + \beta_2 x^2 + \epsilon$$

Degree 3: $$y = \beta_0 + \beta_1 x + \beta_2 x^2 + \beta_3 x^3 + \epsilon$$

Degree 4: $$y = \beta_0 + \beta_1 x + \beta_2 x^2 + \beta_3 x^3 + \beta_4 x^4 + \epsilon$$

Degree n: $$y = \beta_0 + \beta_1 x + \beta_2 x^2 + \beta_3 x^3 + \cdots + \beta_n x^n + \epsilon$$