Nonlinear regression

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Nonlinear regression

- Assume our data is $\{(x_1, y_1), (x_2, y_2) \ldots (x_n, y_n)\}$.
- A normal *nonlinear* model of this data is as follows:

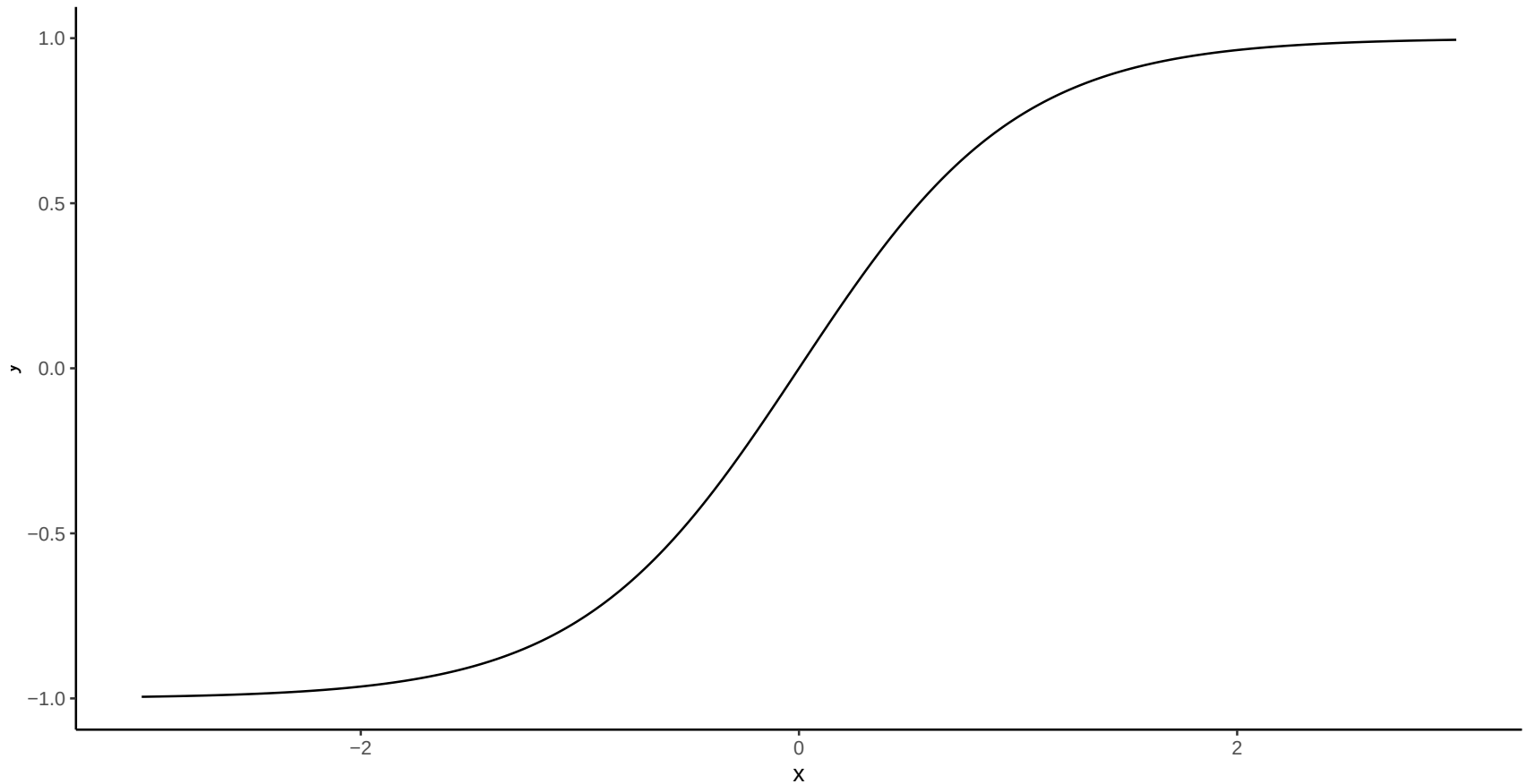
$$y_i \sim N(\mu_i, \sigma^2)$$

where

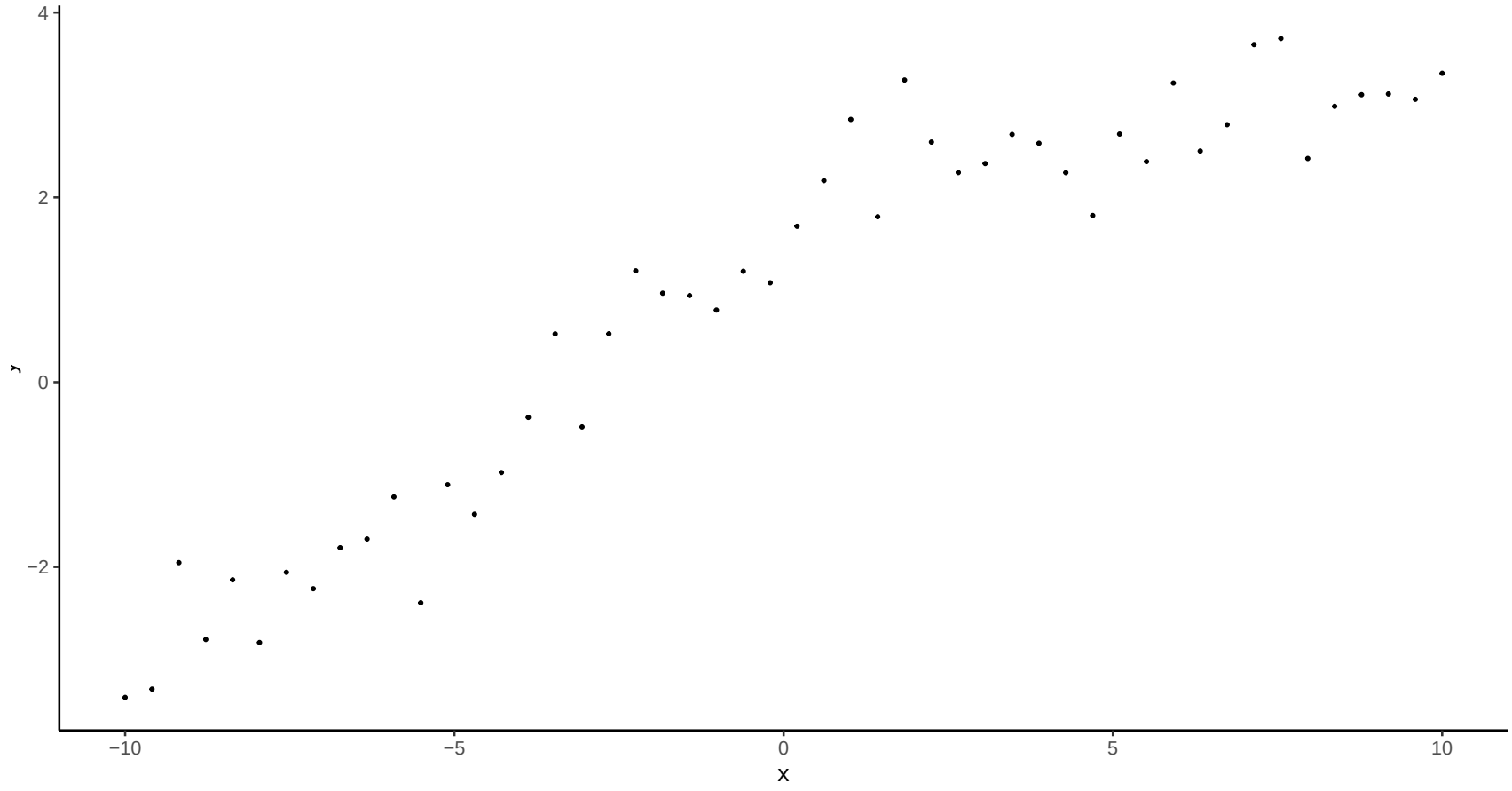
$$\mu_i = f(x_i)$$

with f being a nonlinear function.

A smooth nonlinear function



Smooth function plus noise



Fitting using `nls`

```
M <- nls(y ~ b * tanh(alpha + beta * x),
         start = list(b = 1, alpha = 0, beta = 1),
         data = Df)
```