Polynomial regression

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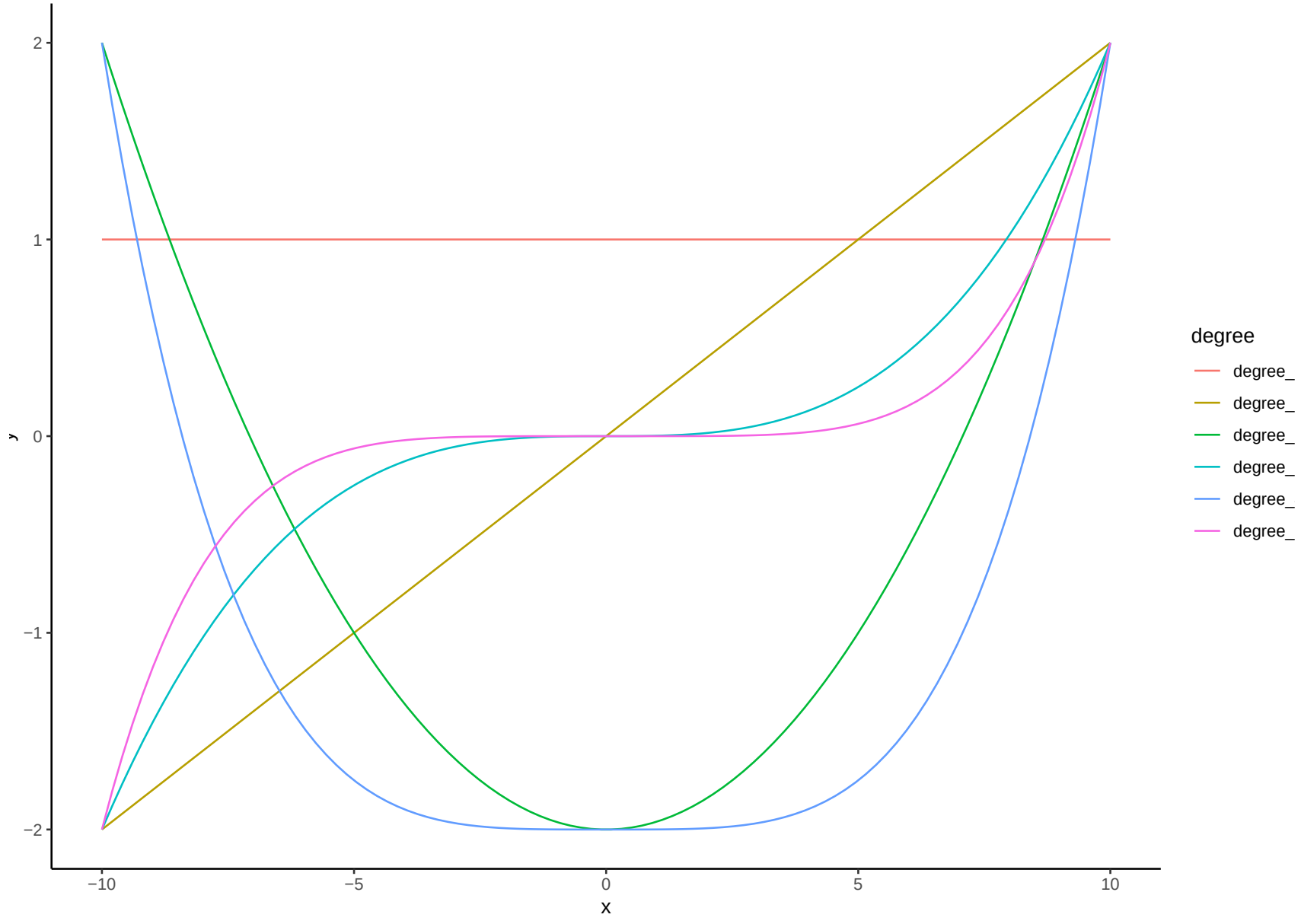
Normal polynomial regression

In normal polynomial regression, of degree K, with one predictor x, we have

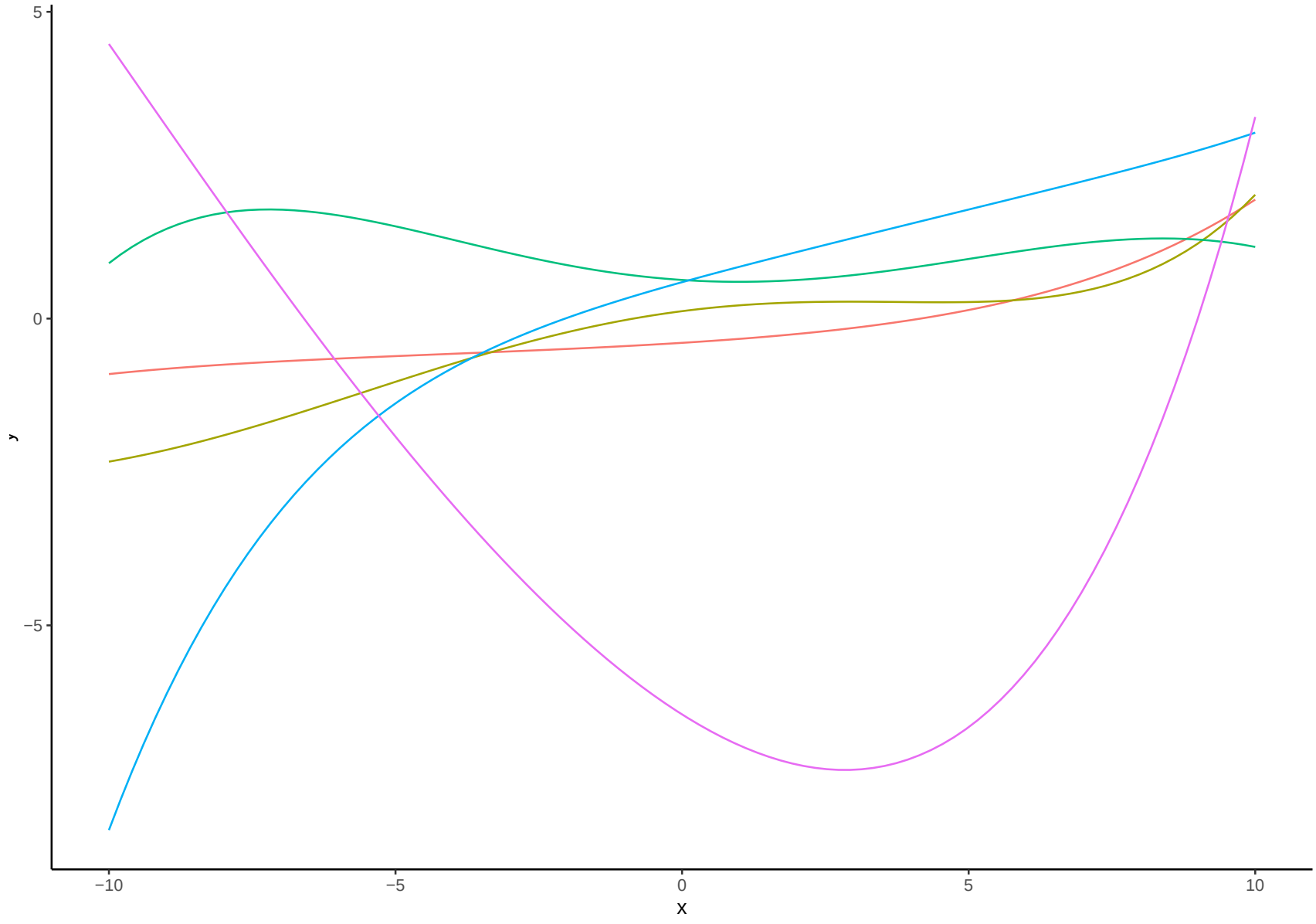
$$y_i \sim N(\mu_i, \sigma^2), \quad \text{for } i \in 1 \ldots n$$

$$\mu_i = \beta_0 + \sum_{k=1}^{K} \beta_k x_i^k.$$

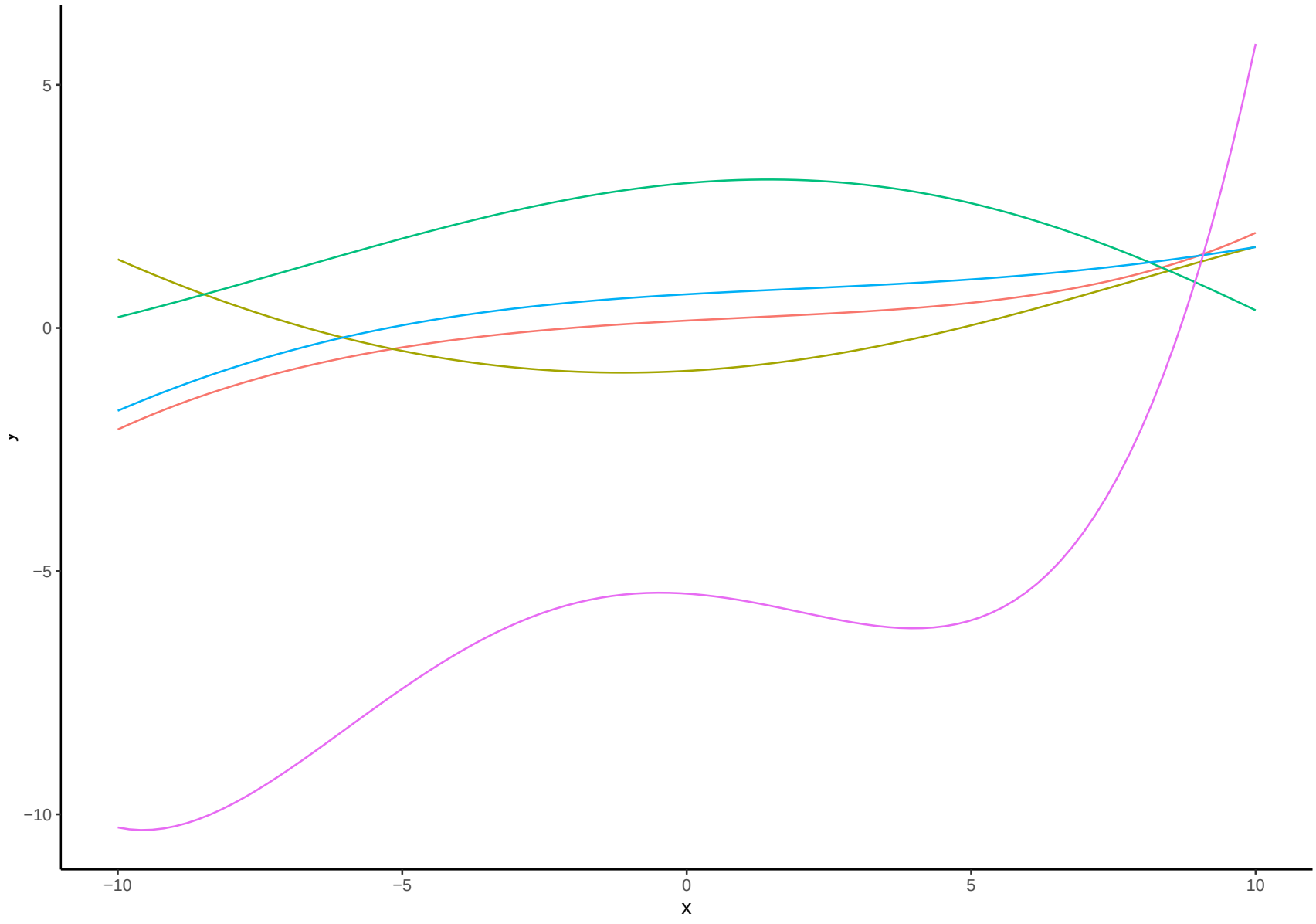
Polynomials from degree 0 to 5



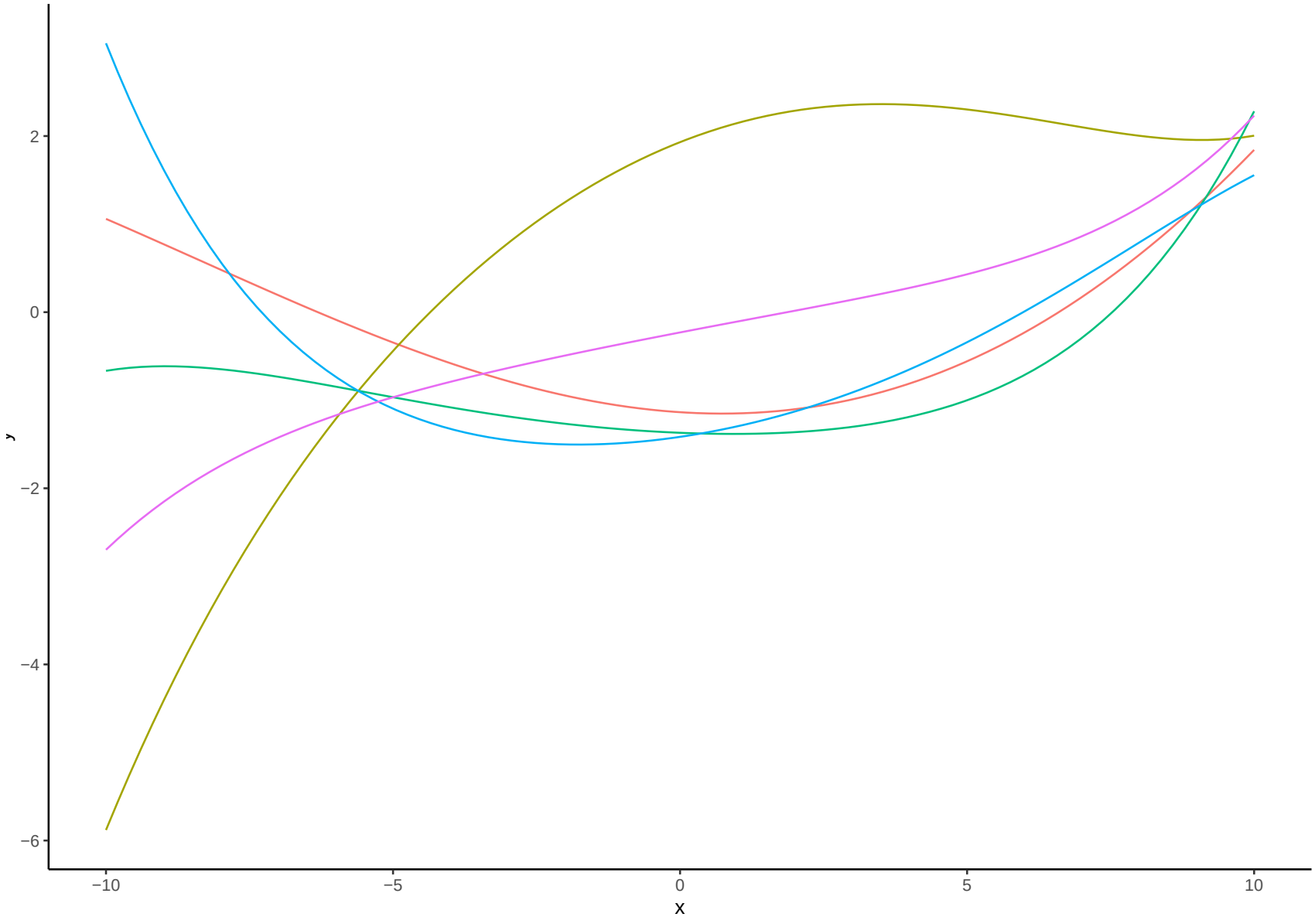
Weighted sums of polynomials: Example 1



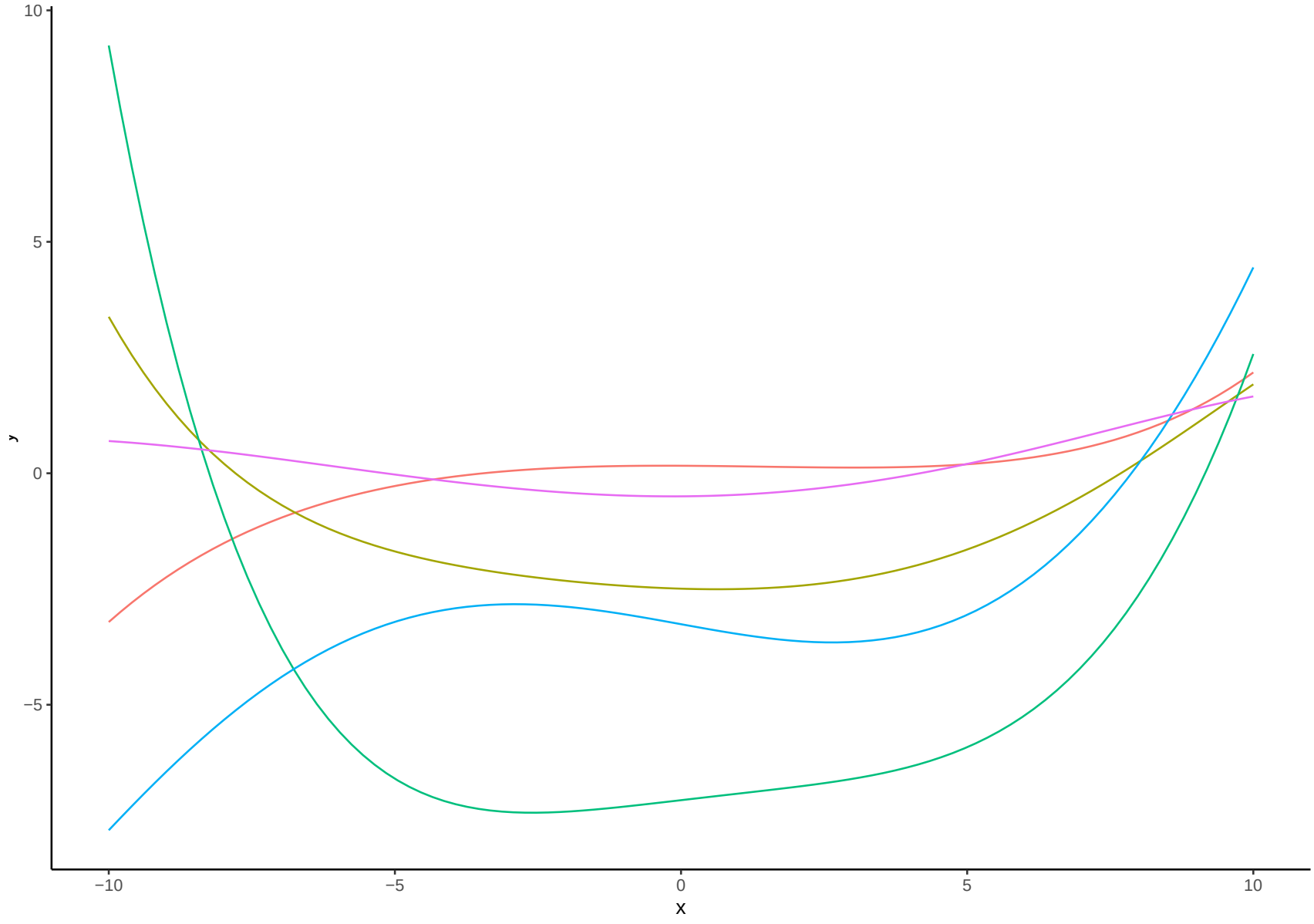
Weighted sums of polynomials: Example 2



Weighted sums of polynomials: Example 3

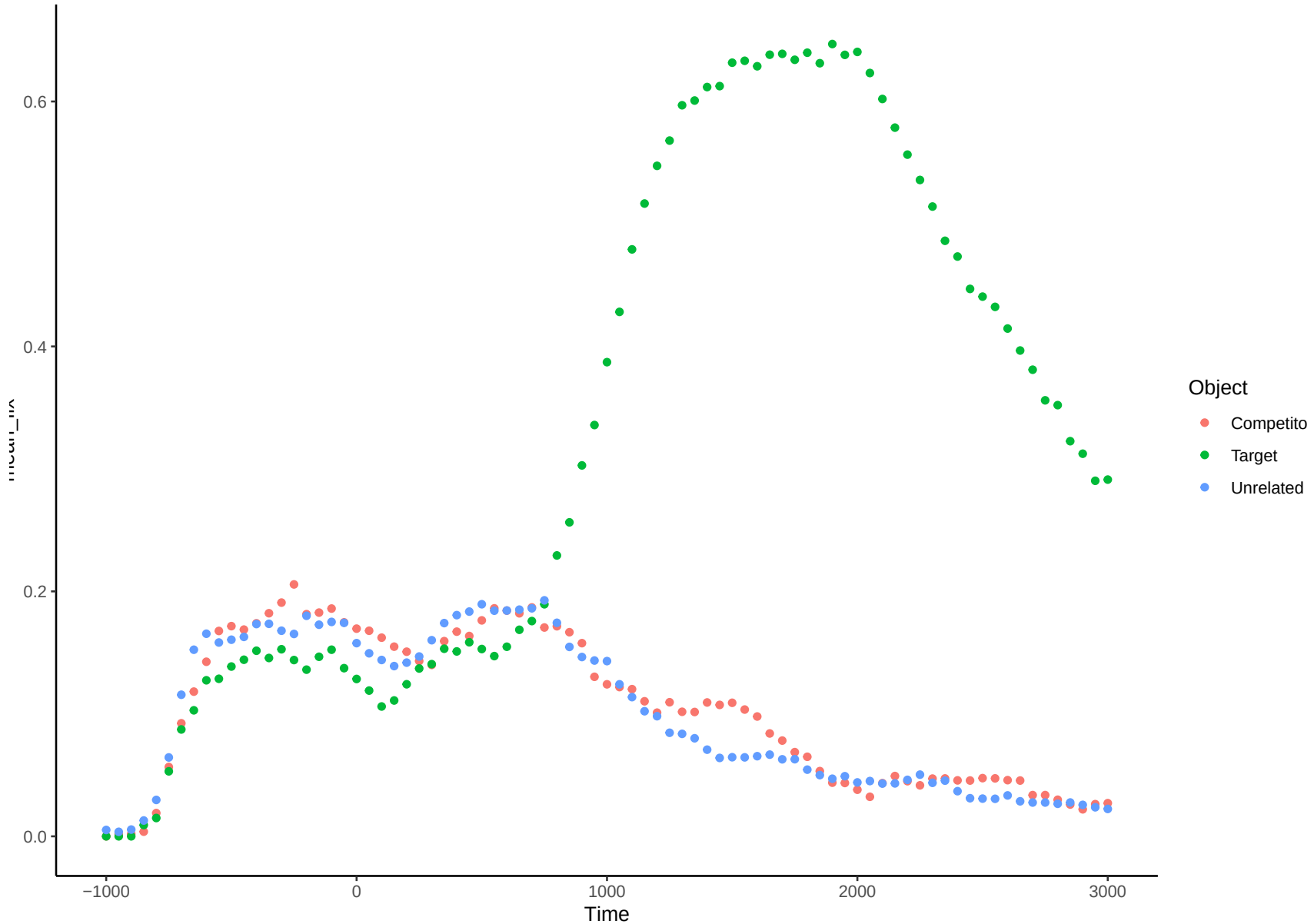


Weighted sums of polynomials: Example 4



Eye tracking data

```
eyefix_df <- read_csv('funct_theme_pts.csv')
```



Polynomial regression in R

- Polynomial of a specified degree can be performed as follows:

```
y ~ x + I(x^2) + I(x^3)
```

but much easier as follows:

```
y ~ poly(x, degree=3, raw=T)
```