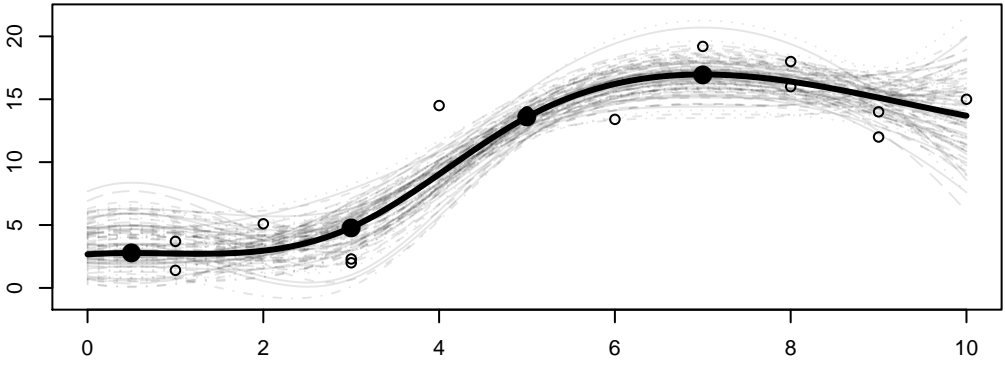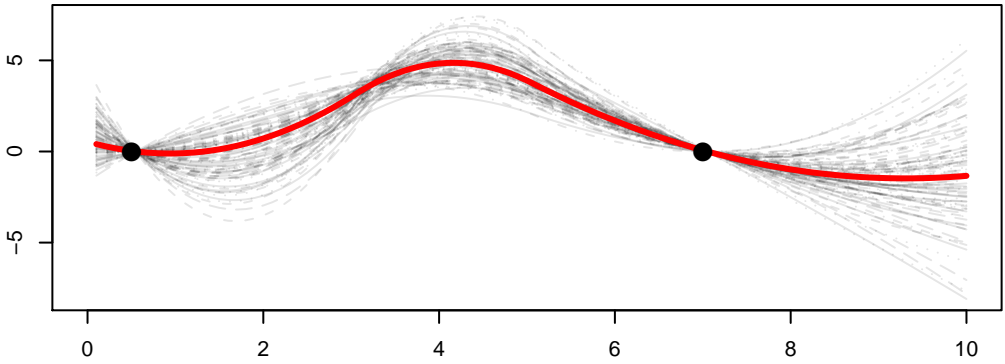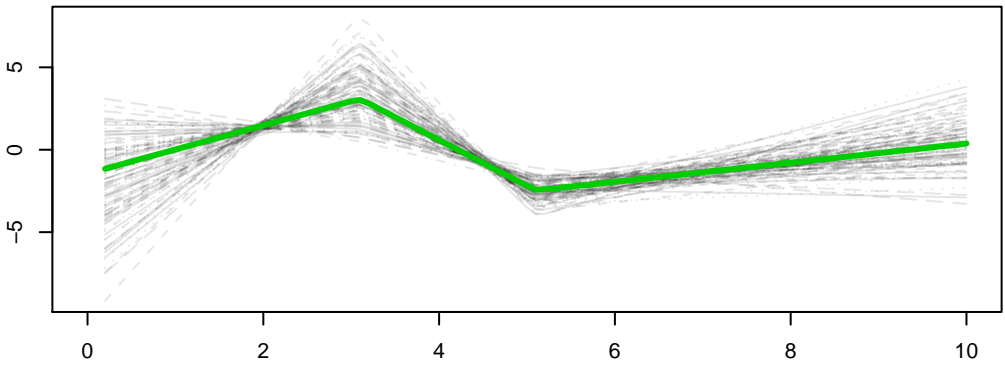**Cubic Spline fit to data**

First derivative

Second derivative

Third derivative