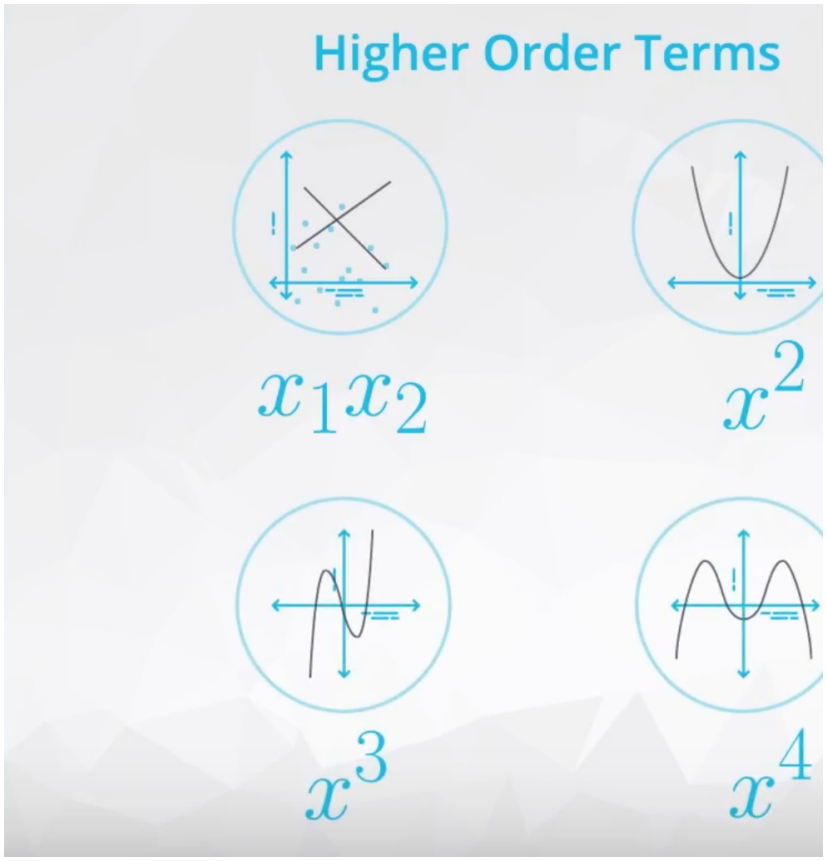
## How to Identify Higher Order Terms?

Higher order terms in linear models are created when multiplying two or more x another. Common higher order terms include **quadratics** ($x_1^2$) and **cubics** ($x_1^3$), multiplied by itself, as well as **interactions** ($x_1 x_2$), where two or more x-variabl one another.




In a model with no higher order terms, you might have an equation like:

$$\hat{y} = b_0 + b_1 x_1 + b_2 x_2$$

Then we might decide the linear model can be improved with higher order term change to:

$$\hat{y} = b_0 + b_1 x_1 + b_2 x_1^2 + b_3 x_2 + b_4 x_1 x_2$$

Here, we have introduced a quadratic ($b_2 x_1^2$) and an interaction ($b_4 x_1 x_2$) term ir

In general, these terms can help you fit more complex relationships in your data take away from the ease of interpreting coefficients, as we have seen so far. You "How do I identify if I need one of these higher order terms?"

When creating models with **quadratic**, **cubic**, or even higher orders of a variabl looking at how many curves there are in the relationship between the explanatc variables.

If there is one curve, like in the plot below, then you will want to add a quadratic line isn't the best fit for this relationship.