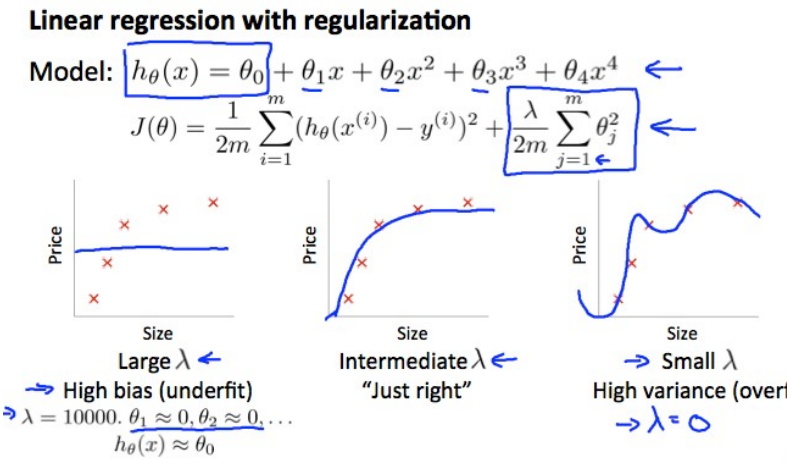
Regularization and Bias/Variance

Note: [The regularization term below and through out the vi should be $\frac{\lambda}{2m}\sum_{j=1}^{n}\theta_j^2$ and **NOT** $\frac{\lambda}{2m}\sum_{j=1}^{m}\theta_j^2$]



In the figure above, we see that as λ increases, our fit becom more rigid. On the other hand, as λ approaches 0, we tend t over overfit the data. So how do we choose our parameter λ get it 'just right' ? In order to choose the model and the regularization term λ, we need to:

1. Create a list of lambdas (i.e. λ∈{0,0.01,0.02,0.04,0.08,0.16,0.32,0.64,1.28,2.56,5.12,1(
2. Create a set of models with different degrees or any ot variants.
3. Iterate through the λs and for each λ go through all th models to learn some Θ.
4. Compute the cross validation error using the learned Θ (computed with λ) on the $J_{CV}(\Theta)$ **without** regularizati λ = 0.
5. Select the best combo that produces the lowest error o cross validation set.
6. Using the best combo Θ and λ, apply it on $J_{test}(\Theta)$ to s