Problem 5

(a) The cubic one's will be smaller

Because for the cubic one we have more predictors, hence we have a more flexible model. This will reduce the training error, namely RSS.

(b) The linear one's is smaller

Because the real model is linear and the linear is fitting exactly the right thing while the cubic one fitted too much noise in the training data, it is too flexible in this content. Therefore it will have larger test error than the linear one.

(c) The cubic one's will be smaller.

Also like (a), because the cubic one is more flexible. It has lower training error

(d) There's not enough information to tell.

If the true relationship is more close to linear, then the linear model will have lower test error, otherwise the cubic one's test error will be lower.