

## L7 PROBLEM 3 (5/5 points)

To model data effectively, it is important to understand the underlying model that describes the data. This means that knowing the physical phenomenon or event that is being modeled is extremely important. For each of the following data/phenomena/events, describe what type of model (linear, quadratic, other) you would use to describe the underlying phenomena.

1. Hourly temperature from 7am to 7pm

quadratic ▾

2. Gravitational force on an object as mass increases

linear ▾

3. Displacement of a mass on a hanging spring from the ceiling

other ▾

It is also important to understand physical phenomena and their limitations when modeling data. Which of the following are true?

- ☒ Even though hourly temperature fluctuations throughout the day may oscillate for a variety of reasons (wind, cloud cover, etc), the underlying trend is quadratic and using a quadratic model is most appropriate.
- ☐ You can eliminate a small number of non-outlier data points in order to construct a model that has a better fit.
- ☒ At some point, some physical phenomena have limitations that do not fit their mathematical models (i.e. springs have an elastic limit).

When modeling, the model that has the biggest  $R^2$  value is always the best model.

- ☐ True
- ☒ False ✓

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