

### Final Exam Project on Applications of Calculus

As part of your final exam you are asked to complete the following project. This project will be weighted as 10% of the final exam. In addition there will be several other parts of the final exam.

You are to take a fifteen-minute drive (preferably with a parent as the driver and you as the passenger). This drive must not be 15 minutes of driving on an expressway. It must be a trip with different speeds. Use a data sheet to record all the data. (See the example below of the data to collect).

- At the outset of the fifteen-minute time interval, record the exact odometer reading.
- Each minute of the drive (on the minute), ask the driver for the speedometer reading and record these on your data sheet. Between speedometer readings you should also make notes of significant observations about the speed of the car (stop and go traffic, steady traffic flow, or the like).
- Finally, at the close of the fifteen minutes, record the exact odometer reading.
- Obtain a scatterplot of the data.
- Use the graph link to merge a copy of the scatterplot into your report below.
- Determine the average velocity for your trip. Approximate a time where you believe the instantaneous velocity was also equal to this average velocity.
- Use the trapezoidal rule with the scatterplot to approximate the distance traveled, and compare your approximations with the difference between the two odometer readings.

Starting odometer reading

Ending odometer reading

time	speedometer readings	special observations during last interval
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- All Data must be collected by the day of your final exam: Bring all data to class on your final exam day.
- On the day of your final you will write up your results, accompanied with the appropriate graph of velocity vs. time, in the form of a lab report including the following categories.
  - Purpose
  - Method
  - Data and Observations
  - Calculations and Results
  - Analysis and Conclusions

The total length of the report should not exceed three pages, including the graph.