

NAME \_\_\_\_\_

DATE \_\_\_\_\_

**Scenario**

A police officer pulls over a truck driver and says that the driver was speeding. They have the following conversation:

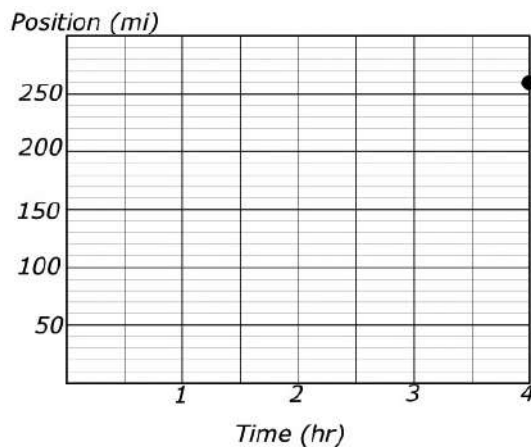
**Driver:** The speed limit is 65 miles per hour. I started my shift at noon and it is 4 p.m. now. According to my travel logs, I have only traveled 260 miles.

**Police officer:** Okay, but you were going faster than the posted speed limit of 65 miles per hour when you passed me.

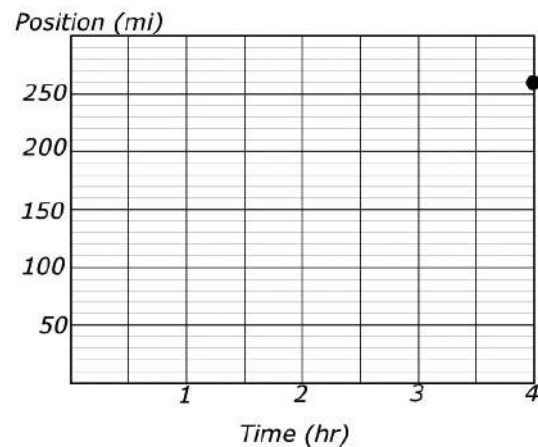
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**PART A:** Sketch two graphs representing the truck's distance as a function of the time that has elapsed. Noon is  $t = 0$  and 4 p.m. is  $t = 4$  hr. The dot represents the 260 miles that the truck has traveled when the driver is pulled over. For the first graph, sketch the position of the truck as a function of time assuming that the truck driver is correct in that he obeyed the speed limit the entire time. For the second, sketch a possible graph of the position of the truck as a function of time assuming that the police officer is correct, and the truck was speeding at the time the driver passed the police officer.

(i) Case 1: The truck has obeyed the speed limit his entire trip.



(ii) Case 2: The truck was speeding at the time the driver passed the police officer.



## 11.A Average vs. Instantaneous Speed

**PART B:** Explain in a clear coherent paragraph-length response how the truck driver and the police officer can both be telling the truth, and the police officer was still correct in pulling the truck driver over for speeding.

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