

## Lab Questions for the Cycloid Trough Lab

1. Most students expect the oscillating run to take much longer than the straight run. Why?
2. When you timed your trough, what did you notice about the time taken for a ball to move straight down the center of the trough and the time that a ball takes to roll down while oscillating from side-to-side? (Use 95% Confidence Interval to draw your conclusion – instructions will be given in class.)
3. What conclusions do you draw about your data? Does there appear to be a statistically significant difference between the motion straight down the ramp and the oscillation? Do any specific trial runs seem to warrant the collection of more data? Why or why not?
4. What do you notice about the general shape of the plotted position vs. time data?
5. What does the shape of the plot reveal about the motion of the ball? Explain your answer.
6. What's the difference between average speed and instantaneous speed?
7. What aspect of a position versus time plot indicates the speed of an object? Specifically, how does the appearance of your plot reveal information about the *instantaneous* speed of the steel ball bearing?
8. How can we determine the actual "size" (in seconds) of time interval between each data point?