Del Worsham breaks Bristol Funny Car time record (June 15, 2013)

BRISTOL, Tenn. (AP) Del Worsham broke Bristol Dragway's Funny Car time record with a 4.008-second run Friday in qualifying for the NHRA Thunder Valley Nationals.

The run also was the quickest in Worsham's career and the best Funny Car time this season. He reached a top speed of 314.83 mph in his Toyota Camry.

"It was a great run," Worsham said. "I was kind of wowed myself. The car's been running better at every individual race. The crew chiefs along with Jim Oberhofer and Connie Kalitta have been working together and making a lot of headway. I'm really excited for the guys on this team. For the last six years, they've been working really hard to find success and I feel really good about where we're going."

Jack Beckman was second at 4.012 at 317.05, breaking the track speed record in his Dodge Charger. Spencer Massey led the Top Fuel field, and Mike Edwards topped the Pro Stock lineup, both breaking the track and time and speed marks. Massey had a 3.775 at 326.79 mph, and season points leader Mike Edwards finished at 6.645 at 207.72 in a Chevy Camaro for ninth No. 1 of the season and 50th overall.
Part 1)

Your assignment is to produce a set of consistent acceleration vs time, velocity vs. time and distance vs time graphs for Worsham’s race. The graphs should be as complete as possible with axis labeled and units. You will need to both integrate and differentiate at three different times to check your graphs quantitatively. Be careful to do this for a complete race, Del needs to start with zero velocity and end with zero velocity.

Watch this video to see a full race. This sport is not for the faint of heart.

https://www.youtube.com/watch?v=Q8xAb2OKxoY

https://www.youtube.com/watch?v=kZIpMzF-4NI

There may be some more useful information here: http://en.wikipedia.org/wiki/Funny_Car
Part 2)

Generate an analytic function that approximates the velocity vs. time curve that you produced in Part 1. By analytic function, we mean a closed form with functions that you know like: x, x^2, x^3, sin(x), e^x, etc. You want this function to be both as simple as possible and as accurate a representation of the v vs t curve, often these are in conflict and so compromises must be made. Make a graph showing your original v vs. t curve and the analytic approximation.

Now calculate the a vs. t and d vs. t curve from your model analytic function. Produce two more graphs, a vs. t and d vs. t that show the original graphical model and the analytic model.

Once you have the three kinematic graphs you should discuss what are the relative strengths and weaknesses of these two approaches.