

Project 3
November 20, 2002

Name _____
Name _____
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According to tests conducted by *Road and Track*, a 1993 Toyota Supra Turbo accelerates from 0 to 30 in 2.2 seconds and travels 1.4 miles (1320 feet) in 13.5 seconds, reaching a speed of 107 mph. *Road and Track* reported the data given in the following table.

Time (seconds)	Speed reached form rest (mph)
0	0
2.2	30
2.9	40
4.0	50
5.0	60
6.5	70
8.0	80
9.0	90
11.8	100

1. Convert the speed data to feet per second, and find a quadratic model for velocity (in feet per second) as a function of time (in seconds). How closely does your model predict a speed of 107 mph at 13.5 seconds?
2. Add the data point for 13.5 seconds, and find a new quadratic model for velocity.
3. Use four rectangles and your model from part 2) to estimate the distance traveled during acceleration from rest to a speed of 50 mph and the distance traveled during acceleration from a speed of 50 mph to a speed of 100 mph.
4. Find the distance traveled during
 - (a) Acceleration from rest to a speed of 50 mph
 - (b) Acceleration from a speed of 50 mph to a speed of 100 mph
 - (c) the first 13.5 seconds of acceleration

Compare these answers to your estimates in part 3).