

## A RIDE TO NOWHERE



Here is your chance to borrow the family car if you drive, go out with a friend, or with anyone and waste at least a half an hour of time. You could do this activity on the way to school or on a trip somewhere else. The only stipulation is that it must be at least fifteen minutes of not completely highway driving. Oh, you really can't be alone and do this safely!

Record the beginning odometer reading (mileage). Create a time interval so that you will have at least fifteen readings. Record your speed at the end of each of these time intervals. (This is why you can't be alone, it really wouldn't be safe to drive, time and write all by yourself). Take the final odometer reading.

Create and submit a graph describing your motion from your data. Keep your data table and odometer readings elsewhere.

### Analysis

On the graph you analyzed, show your work to obtain distance and acceleration.

Which graph always has a positive slope, discuss why this is.

Which graph is both positive and negative, discuss this.

Explain the relationship between graphs and how you can go from any one to the other.

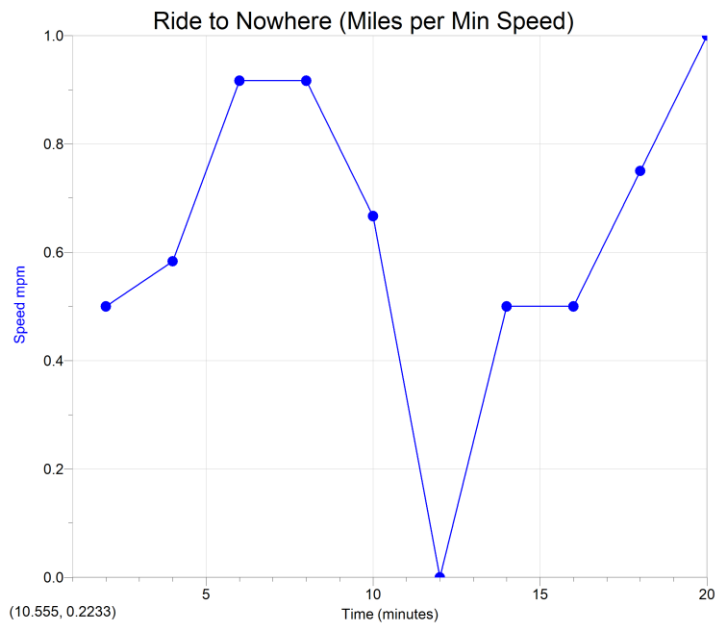
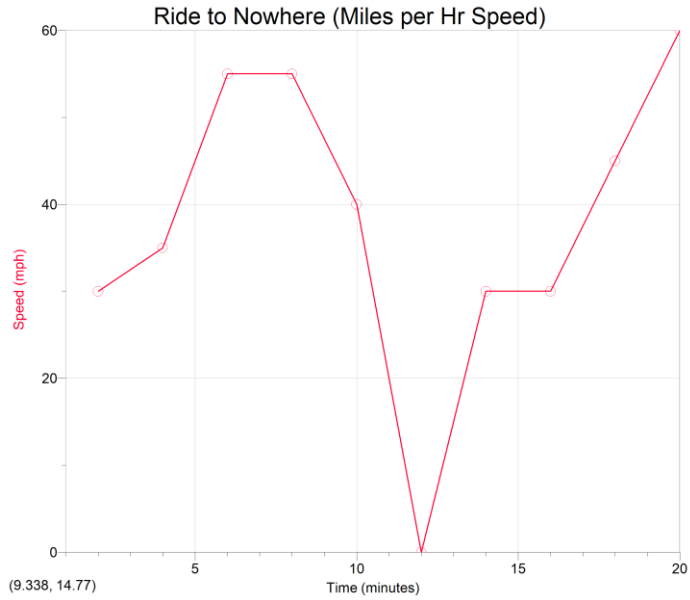
## Data Table

Time	Speed
min	mph
2	30
4	35
6	55
8	55
10	40
12	0
14	30
16	30
18	45
20	60

Table with unit conversion

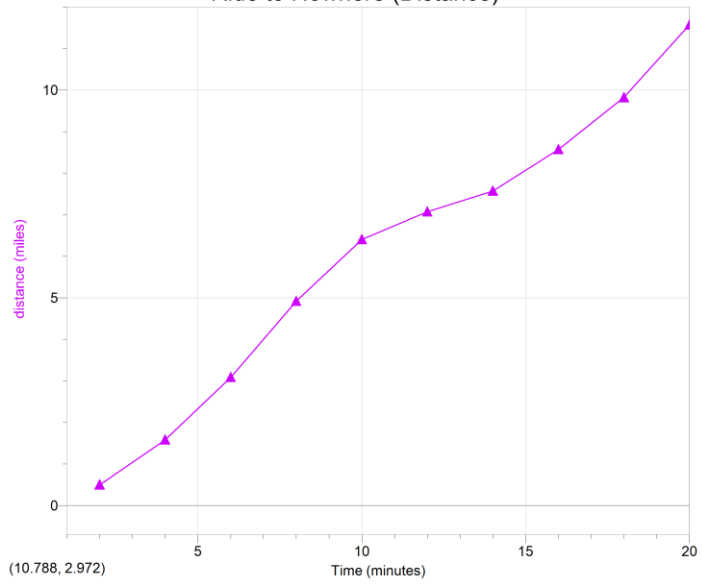
Time	Speed	Speed
min	mph	mpm
2	30	0.5
4	35	0.583333
6	55	0.916667
8	55	0.916667
10	40	0.666667
12	0	0
14	30	0.5
16	30	0.5
18	45	0.75
20	60	1

Below are sample student graphs

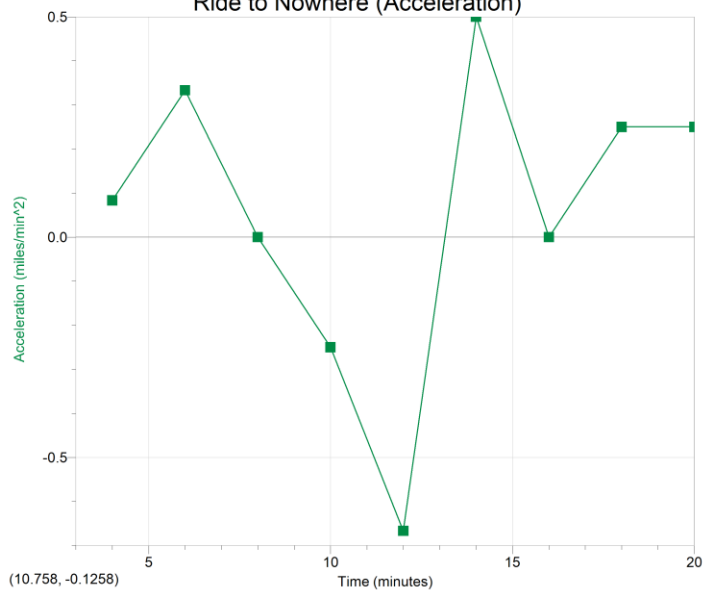


In class teachers will have students exchange papers, typically they have students "be careful of units". Using only the formulas for rectangles and triangles they create a distance graph, using slope they create an acceleration graph. Students then compare their distance to the known odometer reading and calculate a percent error.

Ride to Nowhere (Distance)



Ride to Nowhere (Acceleration)



Calculated Table

Time	Speed	Speed	Acceleration	Distance
min	mph	mpm	m/min <sup>2</sup>	Miles
2	30	0.5		0.5
4	35	0.583333	0.083333333	1.583
6	55	0.916667	0.333333333	3.083
8	55	0.916667	0	4.917
10	40	0.666667	-0.25	6.401
12	0	0	-0.66666667	7.068
14	30	0.5	0.5	7.568
16	30	0.5	0	8.568
18	45	0.75	0.25	9.818
20	60	1	0.25	11.568