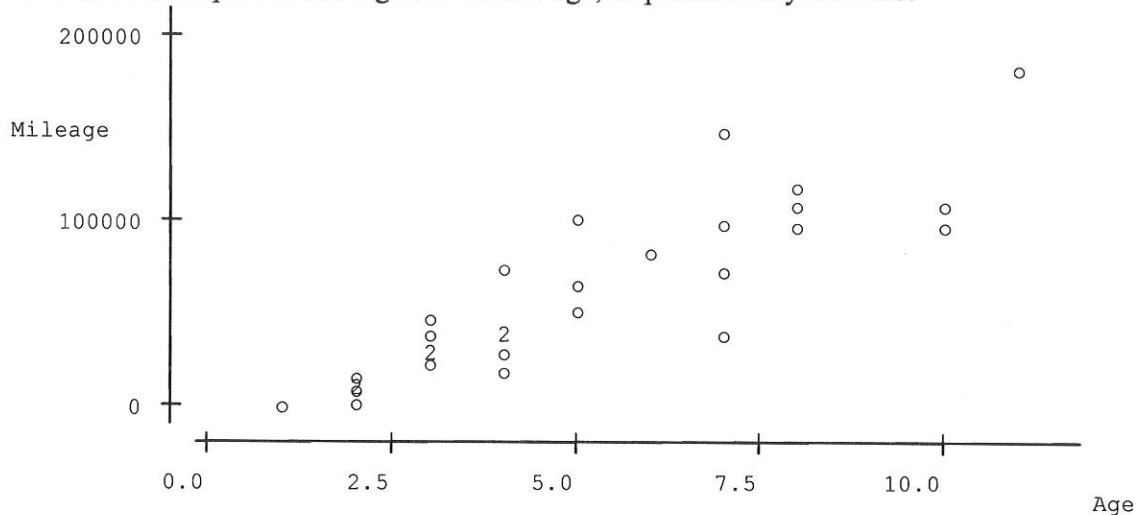


## PREP FOR EXAM 3

Thirty seniors at Council High School were randomly selected and were asked to report the age (in years) and mileage of their primary vehicles. Here are the data that were collected:

ROW	Age	Mileage	ROW	Age	Mileage
1	3	40300	16	7	150000
2	2	11912	17	2	10000
3	3	30000	18	10	110000
4	4	40000	19	5	103000
5	8	98000	20	5	66610
6	3	48000	21	8	110000
7	8	120000	22	4	30323
8	11	185000	23	7	100000
9	4	40000	24	10	98000
10	1	1050	25	2	12000
11	6	85000	26	5	53000
12	4	20000	27	7	40000
13	3	30000	28	4	76000
14	2	17000	29	2	3000
15	3	25000	30	7	75000

Here is a scatterplot of mileage on vehicle age, as produced by Minitab:



Least squares regression was performed by Minitab; here is part of the computer output.

Predictor	Coef	Stdev	t-ratio	p
Constant	-13832	8773	-1.58	0.126
Age	14954	1546	9.67	0.000

$s = 22723$        $R\text{-sq} = 77.0\%$        $R\text{-sq(adj)} = 76.1\%$

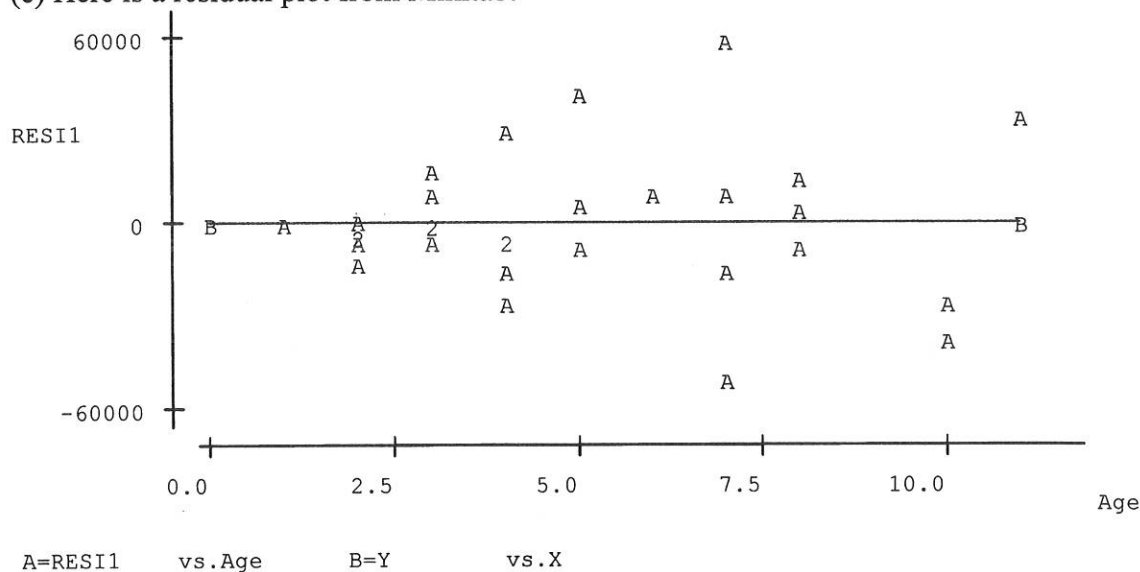
### Unusual Observations

Obs.	Age	Mileage	Fit	Stdev.Fit	Residual	St.Resid
16	7.0	150000	90849	5174	59151	2.67R
27	7.0	40000	90849	5174	-50849	-2.30R

R denotes an obs. with a large st. resid.

- Describe the relationship between vehicle age and mileage. Include a comment on the strength of association.
- Determine the slope of the least squares line. Interpret the slope in the context of this problem.
- Determine the intercept of the least squares line. Interpret the intercept in the context of this problem.
- Minitab reports that  $R\text{-sq} = 77.0\%$  for these data. Write a sentence that explains the significance of this number.

(e) Here is a residual plot from Minitab:



Describe any concerns you might have, if any, as a result of studying this residual plot.

- Define the term "residual." Then calculate the residual for a 5 year-old car.
- For which vehicle does the least squares line make the greatest error?
- What mileage would your least squares line predict for the teacher's 9 year-old car? Then comment on how confident you are in this prediction.