

Name:

ID#:

Section#: 1 2 3 Serial#:

Show the necessary calculations on the back of the sheet

The table below shows the history of car accidents in the years 1990-1993 according to the size of the vehicle. Use it to answer the following questions;

Year	Quarter	Small Vehicle	% of small vehicles	Trucks
1990	1	28	60	19
	2	20	61	13
	3	30	59	21
	4	21	63	12
1991	1	28	62	17
	2	20	63	12
	3	31	64	17
	4	25	65	13
1992	1	40	59	28
	2	30	58	22
	3	35	57	26
	4	28	60	19
1993	1	42	52	39
	2	31	54	26
	3	43	56	34
	4	30	58	22

Using trend-based forecasting method, answer questions (1-3):

- The slope of the trend line of the small vehicles series is
 a. 0.51 b. 0.61 c. 0.71 d. 0.81 **e. 0.91**
- The forecasted value for the 3rd quarter of 1994 is
 a. 47.64 b. 41.64 c. 43.64 **d. 39.64** e. 45.64
- The percentage of variation in the # of small vehicles explained by the variation in time is
 a. 6.8% b. 16.8% **c. 36.8%** d. 56.8% e. 66.8%
- The simple index of the 2nd quarter of 1990 based on that of 1993 is *for the trucks*
 a. 40% **b. 50%** c. 60% d. 70% e. 80%
- The un-weighted index for the 1st quarter of 1992 based on that of 1991 is
a. 150% b. 160% c. 170% d. 180% e. 190%
- The Laspyre's index for 1992 based on 1990 is *of the 4th quarter*
a. 141% b. 131% c. 121% d. 111% e. 101%

With My Best Wishes

① Using t as independent (Quarter) and Small vehicle as dependent \Rightarrow Small vehicle = $22.425 + 0.906 \text{Quarter}$

$$\text{Slope} = \boxed{0.906}$$

② 3rd quarter of 1993 $\Rightarrow t = \textcircled{19} = 16 + 3 \Rightarrow$

$$\text{Small vehicle} = 22.425 + (0.906)19 = \boxed{39.64}$$

$$\textcircled{3} R^2 = r^2 = (0.6066)^2 = 0.368 \approx \boxed{36.8\%}$$

$$\textcircled{4} I = \frac{T_{t=3}}{T_{t=15}} \times 100 = \frac{13}{26} \times 100 = \boxed{50\%}$$

$$\textcircled{5} \text{Unweighted} = \frac{(T_9 + S_9)}{(T_5 + S_5)} \times 100 = \frac{(40 + 28)}{(28 + 17)} \times 100 = 151.11\% \\ \approx \boxed{150\%}$$

$$\textcircled{6} \text{Laspy's} = \frac{\sum P_{92} Q_{90}}{\sum P_{90} Q_{90}} \times 100 = \frac{28(0.63) + 19(0.37)}{21(0.63) + 12(0.37)} \times 100 \\ = 139.61\% \approx \boxed{141\%}$$