years since 1990. Thus, the year 1990 was recorded as year 0. They fit a least squares regression line to the data. The graph of the residuals and part of the computer output for their regression are given below.

- a. Is a line an appropriate model to use for these data? What information tells you this?
- Van low . b. What is the value of the slope of the least squares regression line? Interpret the slope in context of this situation.

OOUS

What is the value of the intercept of the least squares regression line? Interpret in the context of this situation. What is the predicted number of commercial

2440.941

peed and

S Reed in the Ses steps per se increases. There doesn't to be different

what was the actual number of commercial aircraft flying in 1992? Value - 3101 Value - 3101 Value - 3101 Value - 3101= 2039,031733,5172

Yessthe Residual

4. In a study of the application of a certain type of weed killer, 14 fields containing large numbers of weeds were treated. The weed killer was prepared at seven different strengths by adding 1, 1.5, 2, 2.5, 3, 3.5, or 4 teaspoons to a gallon of water. Two randomly selected fields were treated with each strength of weed killer. After a few days, the percentage of weeds killed on each field measured. The computer output obtained from fitting a least squares regression line to the data is shown below. A plot of the residuals is provided as well.

		Sum of		Mean	
	Source	Squares	df	Square	F-ratio
Dependent variable is: percent killed	Regression	8330.16	1	\$330.16	410
R squared = $97.2\%$ R squared (adjusted) = $96.9\%$	Residual	243.589	12	20.2999	
s = 4.505 with $14 - 2 = 12$ degrees of freedom	Variable	Coefficient	s.c. #f Ceeff	t-ratio	Prob
	Constant	-20.5893	3.242	-6.35	$\leq 0.0001$
	No. Teaspoons	24.3029	1.204	20.3	$\leq 0.0001$



Substitutes x = 2.6 into the regression equation to get a predicted value of 42.83224, and notes that the residuals around the predicted value of 42.8 (or the middle of the predicted values) are negative. Concludes that since the residual for this prediction is negative, the prediction is expected to be too large.

5. Good runners take more steps per second as they speed up. Here are the average numbers of steps per second for a group of top female runners at different speeds. The speeds are in feet per second.

Speed (ft/s)	15.86	16.88	17.5	18.62	19.97	21.06	22.11
Steps per second	3.05	3.12	3.17	3.25	3.36	3.46	3.55

You want to predict steps per second from running speed. Make a scatterplot, and describe the pattern.

Find the least squares regression line of steps per second on running speed. **b**.

How well does your LSRL fit your data? Justify and support your conclusion. C.

If you want to predict running speed from a runner's steps per second, would you use the same line? Explain **d**.

your answer. Would  $r^2$  stay the same?



## c) Residual Plot is curved so LSRL

is not a good fit.