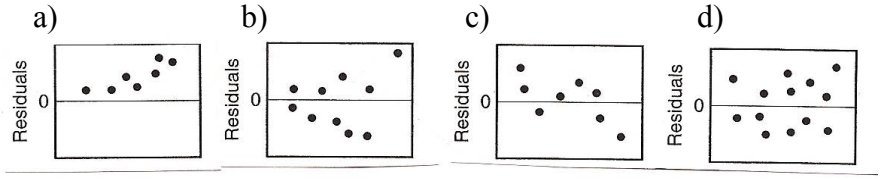
Ch. 3 Review Sheet

1. Which of the following residual plots indicates a reasonable fit to a given set of data?



   e) None of these indicates a reasonable fit.

2. The data given below show the height (in cm) at various ages (in months) for a group of children.

Age	18	19	20	21	22	23	24	25	26	27	28	29
Height	76	77.1	78.1	78.3	78.8	79.4	79.9	81.3	81.1	82.0	82.6	83.5

   The equation for the least-squares regression line is *predicted height = 64.94 + 0.634(age)*. What is the value of the residual for the child who is 19 months old?

3. A student computed a least squares regression line and found that the correlation coefficient was 0.83. In checking her answer she found she had switched the dependent and independent variables. She then computed the regression line using the correct order. What is the new correlation coefficient?

   a) -1/0.83 b) -0.83 c) 0.689 d) 0.83 e) 1/.83

4. The results of a least squares linear regression are shown below:

   $\hat{y} = 7.2 + 3.6x$ $\bar{x} = 1.5$, $s_x = 2$ $\bar{y} = 12.6$, $s_y = 8$

   What is the value of r^2?

   a) 0.12 b) 0.25 c) 0.81 d) 0.90 e) 1.23

5. You are given the following information about a data set.

   $\bar{x} = 8.9$ $s_x = 3.7$ $r = 0.736$
   $\bar{y} = 4.7$ $s_y = 1.2$

   (a) Find the equation of the least squares regression line.

   (b) What is your prediction for y if x is 8.9? (Hint: You should be able to answer the question without doing any calculations.)

6. The weights of children in the Egyptian village of Nahya were recorded. Here are the mean weights of the 170 children in that village by age in months:

Age(months)	1	2	3	4	5	6	7	8	9	10	11	12
Weight(kg)	4.3	5.1	5.7	6.3	6.8	7.1	7.2	7.2	7.2	7.2	7.5	7.8

a) Determine the equation of the LSRL, the correlation and the coefficient of determination for this data set (assuming the age is the explanatory variable).

b) Create a scatterplot of this data on your calculator and show Mr. Lazur.

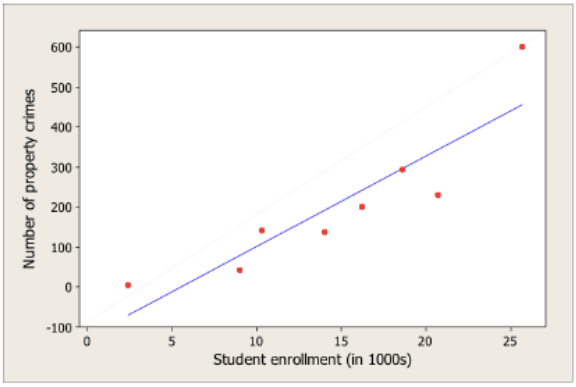
c) Calculate the residuals on your calculator and show Mr. Lazur the residual plot on your calculator.

d) Use the value of r^2 and the residual plot to answer this question: Is the least squares line an acceptable summary of the overall pattern of growth? Explain.

7.

1. The table and scatterplot below show the relationship between student enrollment (in thousands) and total number of property crimes (burglary and theft) in one year for eight colleges and universities in a certain U.S. state.

Enrollment (in 1000s) (x)	No. of Property Crimes (y)
16	201
2	6
9	42
10	141
14	138
26	601
21	230
19	294



The equation of the least-squares regression line is $\hat{y} = -112.58 + 21.83x$, where $\hat{y}$ = predicted number of property crimes and x = student enrollment in thousands.

a) Interpret the slope of the LSRL in the context of this problem.

b) How many crimes would you predict at a college with an enrollment of 14 thousand students?

c) Find the residual for the campus with 14 thousand students and 138 property crimes. Interpret the value of the residual in the context of this problem.

d) Would the slope of the regression line change if the point (26, 601) was removed from the data set? If so, in which direction?