

Residuals Practice Worksheet

Name: _____

KEY

Date: _____

1. The data given below shows the height at various ages for a group of children

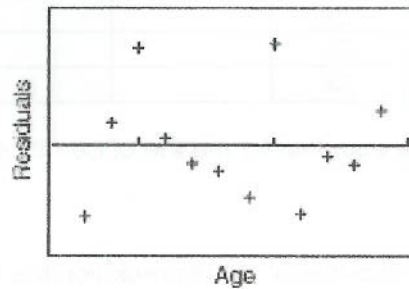
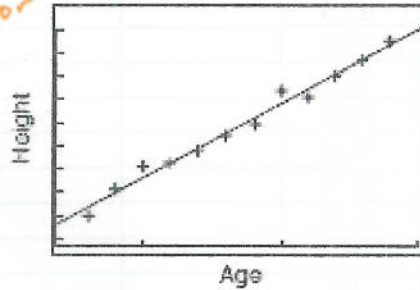
Age (months)	18	19	20	21	22	23	24	25	26	27	28	29
Height (cm)	76	77.1	78.1	78.3	78.8	79.4	79.9	81.3	81.1	82	82.6	83.5

Given the best fit line as: $y = .634x + 64.945$

← Plug in observed - predicted and get predicted values from the table
calculator

X	Y	Predicted	Residual
18	76	76.357	-0.357
19	77.1	76.991	0.109
20	78.1	77.625	0.475
21	78.3	78.259	0.041
22	78.8	78.893	-0.093
23	79.4	79.527	-0.127
24	79.9	80.161	-0.261
25	81.3	80.795	0.505
26	81.1	81.429	-0.329
27	82	82.063	-0.063
28	82.6	82.697	-0.097
29	83.5	83.331	0.169

Sum = -.203



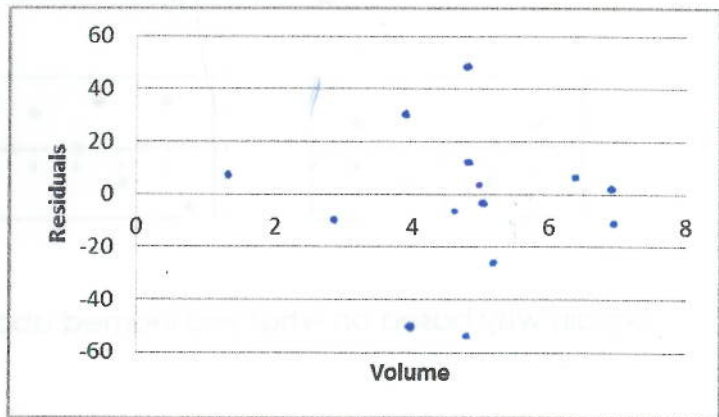
a) Is there a pattern? Is this a good model?

I see a bit of a pattern. This is not a good model as the

residual appears nonlinear and the sum is not real close to 0.

Volume	# of People	Predicted	Residual
5	195	149.89	45.11
5	96	149.89	-53.89
3.1	90	99.095	-9.095
6.8	188	198	-10
6.2	183	181.96	1.04
5	166	149.89	16.11
6.8	200	198	2
5.5	161	143.25	-2.25
4.1	72	125.83	-53.83
4.1	157	125.83	31.17
4.8	137	144.54	-7.54
1.5	68	56.324	11.676
5.6	192	165.93	26.07
5.1	156	152.56	3.44

Sum = 0.11



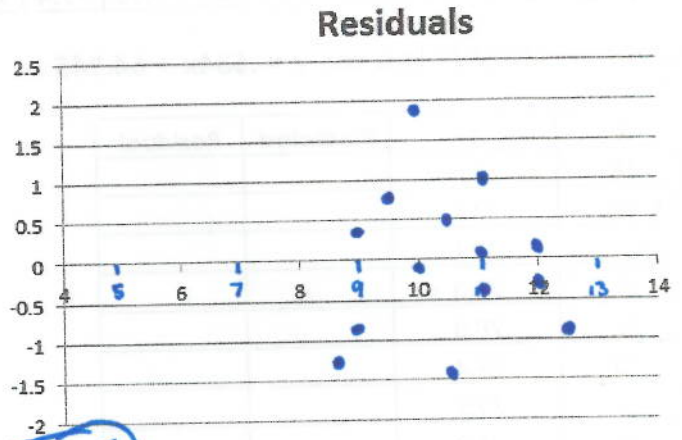
a. If $y = 26.732x + 16.226$, plot the residuals after filling in the table.

b. Based on the residuals plot, is a line a good fit of the data? Explain.

This is not a "great" line of good fit. The sum is not 0 but most residuals are clustered with a few "way" out. So I would say it is OK!

3. Consider the following data: The shoe sizes and heights (in inches) for men.

Shoe Size (x)	Height (y)	Predicted Height	Residual (Actual-Predicted)
8.5	66.0	67.255	-1.255
9.0	68.5	68.19	0.31
9.0	67.5	68.19	-0.69
9.5	70.0	69.125	0.875
10	70.0	70.06	-0.06
10	72.0	70.06	1.94
10.5	71.5	70.995	0.505
10.5	69.5	70.995	-1.495
11.0	71.5	71.93	-0.43
11.0	72	71.93	0.07
11.0	73	71.93	1.07
12.0	73.5	73.8	-0.3
12.0	74	73.8	0.2
12.5	74	74.735	-0.735



Sum = 0.005

a. Find the equation for the line of best fit, as well as the correlation coefficient.

Stat → edit → enter lists
Stat → calc → #4

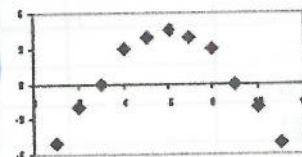
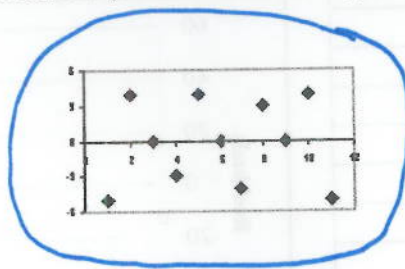
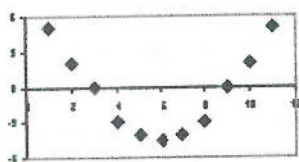
$y = ax + b$
 $a = 1.870009285$
 $b = 51.36025998$

$y = 1.87x + 51.36$

b. Is there a pattern? Is the prediction line the best model for the data? How can you tell?

NO pattern and the equation is pretty good. The sum of the residuals is very close to 0 and the residuals are clustered on the x-axis.

4. Which of the following residual plots indicate a good fit for a linear model?



Explain why based on what you learned about residuals.

The residuals are clustered around the x-axis and somewhat equally distributed