1. (unit 2.1) The table gives the number of inner tubes, I , sold in a bike shop between 2003 and 2008. Determine which model best fits the data.

Year (t)	2003	2004	2005	2006	2007	2008
Inner tubes (I)	40	56	74	91	113	127

(A) Linear

(B) Absolute value

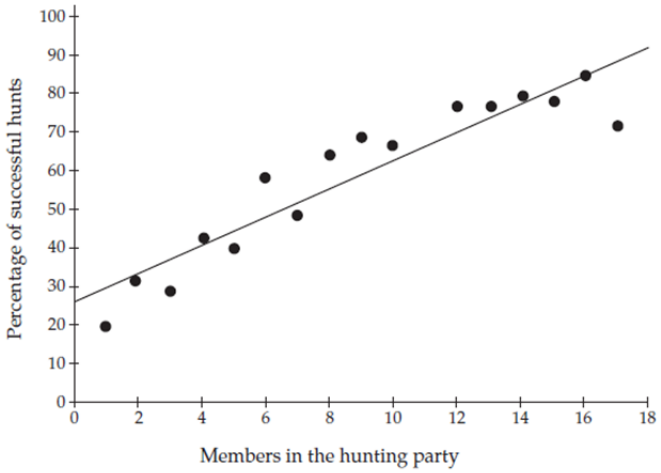
(C) Quadratic

(D) Exponential

2. (unit 1.3) As a furniture salesperson, Marcy gets a 3% commission on all her weekly sales above $5000. Which row in the table show the composite function that will determine her commission if x represents her weekly sales?

	Amount Eligigle for Commission	Commission	Composite Function
(A)	$f(x) = 5000 - x$	$g(x) = 0.03x$	$f(g(x))$
(B)	$f(x) = x - 5000$	$g(x) = 0.03x$	$f(g(x))$
(C)	$f(x) = 5000 - x$	$g(x) = 0.03x$	$g(f(x))$
(D)	$f(x) = x - 5000$	$g(x) = 0.03x$	$g(f(x))$

3. (unit 2.2) In Tanzania, an American scientist studied the hunting habits of chimps. The success rate of a hunt is related to the size of the hunting group. The graph below taken from *American Scientist* (May/June 1995), show the data that was gathered about the percentage of successful hunts for different group sizes.



For the relationship between the two quantities, a regression curve was used.

a) What kind of regression was used? Use this regression curve to estimate the number of members needed to be certain that the hunting will be successful.

b) Looking at the data, you might think that a quadratic fit would be better than the one used. Explain why.

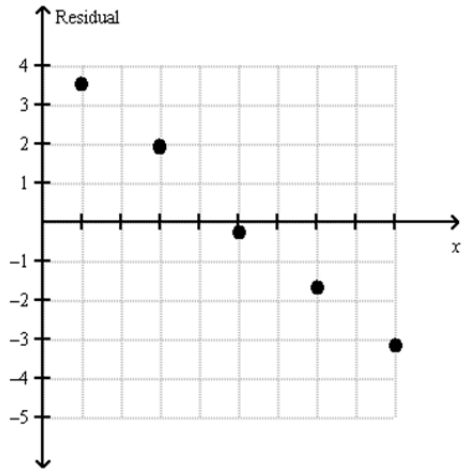
c) What reason could you give to support a non-linear fit?

4. (unit 2.3) Create a residual plot for the table using the linear model $y = 1.8x + 8$.

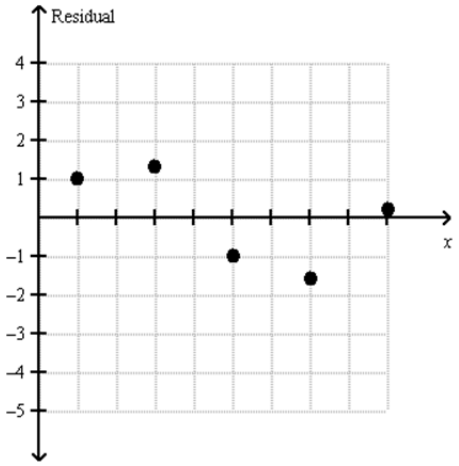
Age, x (months)	0	1	2	3	4	5
Baby's Weight, y (pounds)	7.5	9.5	11.7	13.1	15.2	16.5

5. (unit 2.3) Which residual plot show the best fit between a function and a data set?

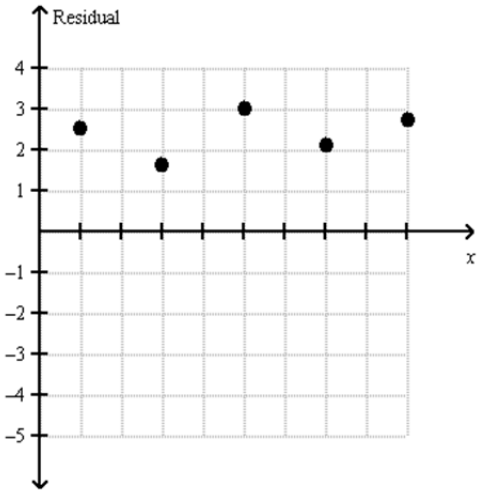
(A)



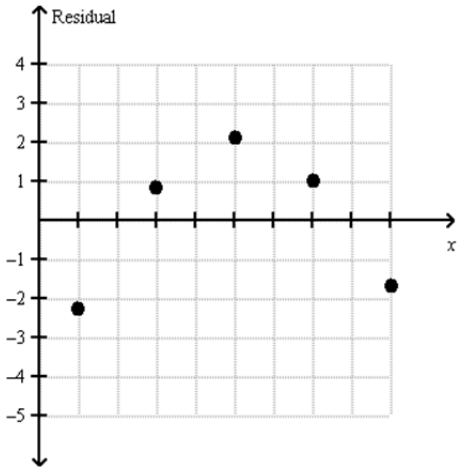
(C)



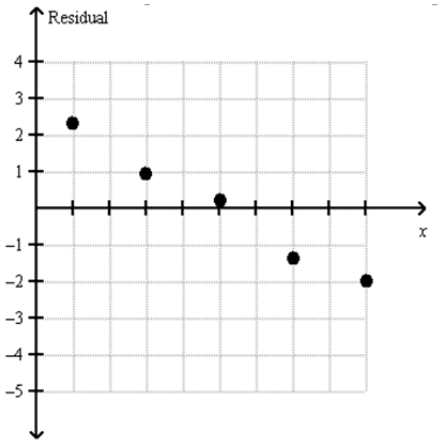
(B)



(D)



6. (unit 2.3) This residual plot shows the relationship between a linear function and a data set.



Is it possible that this function is a line of best fit for the data? How can you tell?

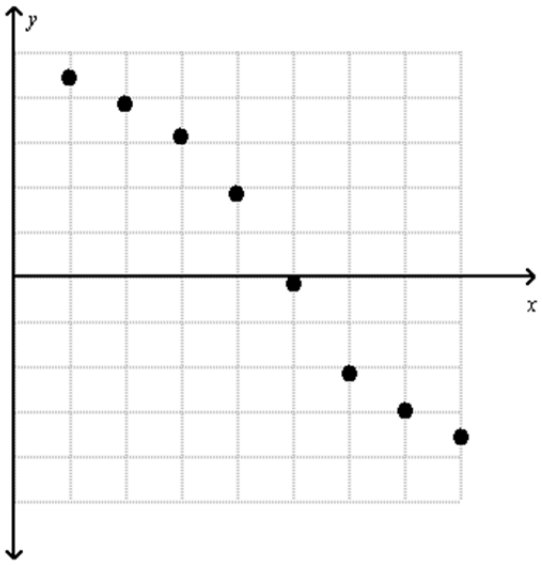
(A) The function could be a line of best fit for the data, because the absolute value of each residual is 2 or less.

(B) The function could be a line of best fit for the data, because the residuals are close to linear.

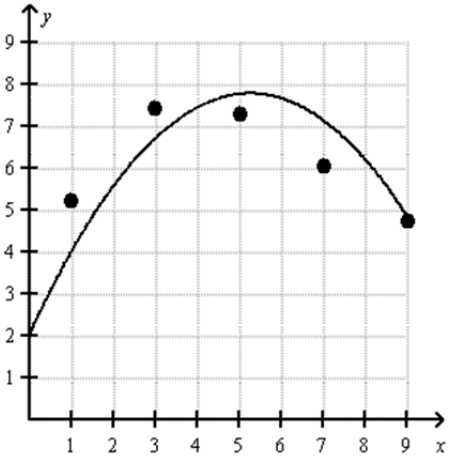
(C) The function is not a line of best fit for the data, because the residuals form a linear pattern that does not have a slope near zero.

(D) The function is not a line of best fit for the data, because the residuals include both 2 and -2.

7. (unit 2.3) The graph represents a residual plot for a data set and a linear model. Based on the residual plot, discuss the goodness of fit of the linear model.

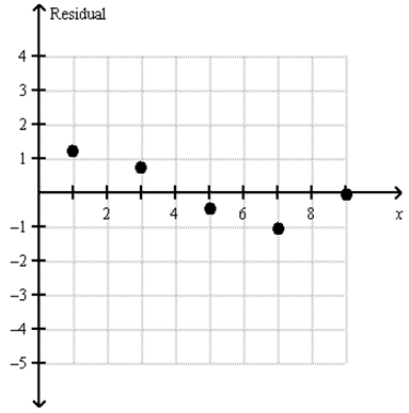


8. (unit 3.14) This graph shows the scatter plot of a data set and a curve of fit.

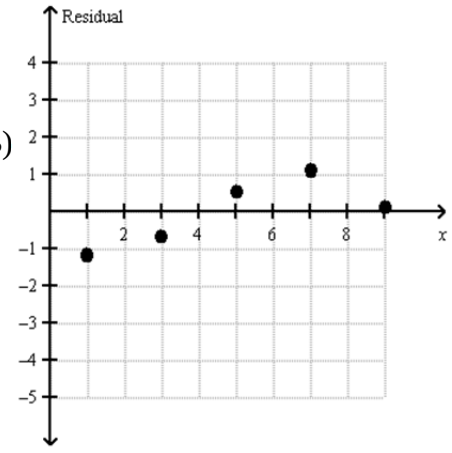


What is the residual plot for this data set and curve?

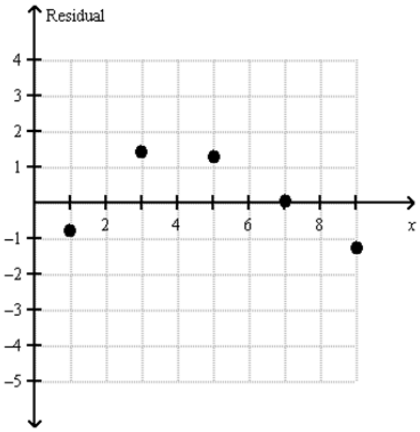
(A)



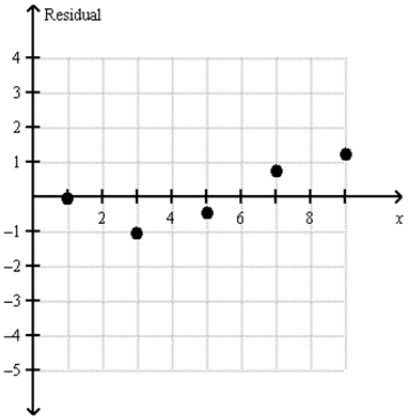
(B)



(C)



(D)



9. (unit 5.5) The relationship between the weight of a whale in tons, W, and the length in feet, L, is given by $W = 0.000137L^{3.18}$. Which expression below would be used to find the length of a whale that weighs 50 tons?

(A) $\sqrt[3.18]{\dfrac{50}{0.000137}}$

(B) $0.000137(50)^{3.18}$

(C) $\dfrac{\sqrt[3.18]{50}}{0.000137}$

(D) $\sqrt[3.18]{50}(0.000137)$

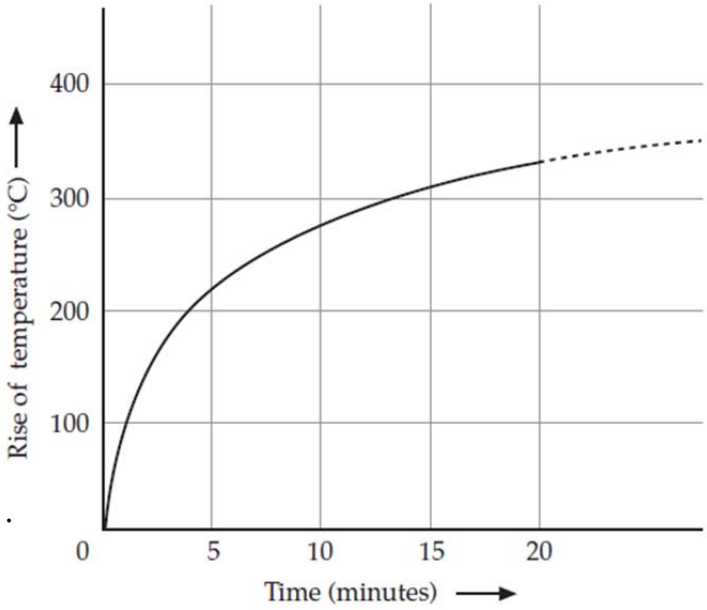
10. (unit 5.8) The graph below shows the change in temperature of a burning house over time.

a) Describe the graph.

b) This graph was found in an old math book and next to it was written:

Rise of temperature = $t^{0.25}$
Show that this function does not describe the graph correctly.

c) Assume that the power function $r = At^{0.25}$ is a good description of the graph. Find a reasonable value for A. Graph the new function.



d) Compare the graph in part (c) to the original one.
Do you think that a different power of t might result in a better model? Would a larger or smaller power produce a better fit? Explain.

e) Use the original graph to find data. Carry out a power regression on the data to find a function that would produce a better fit.