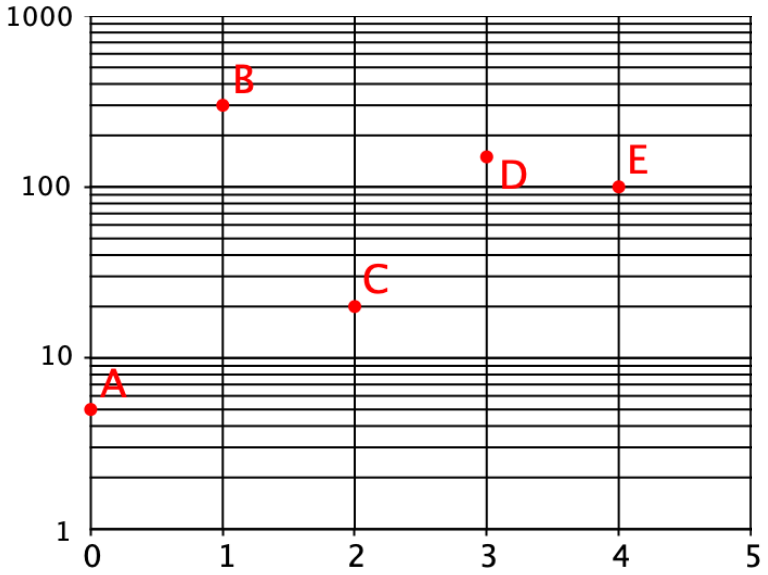
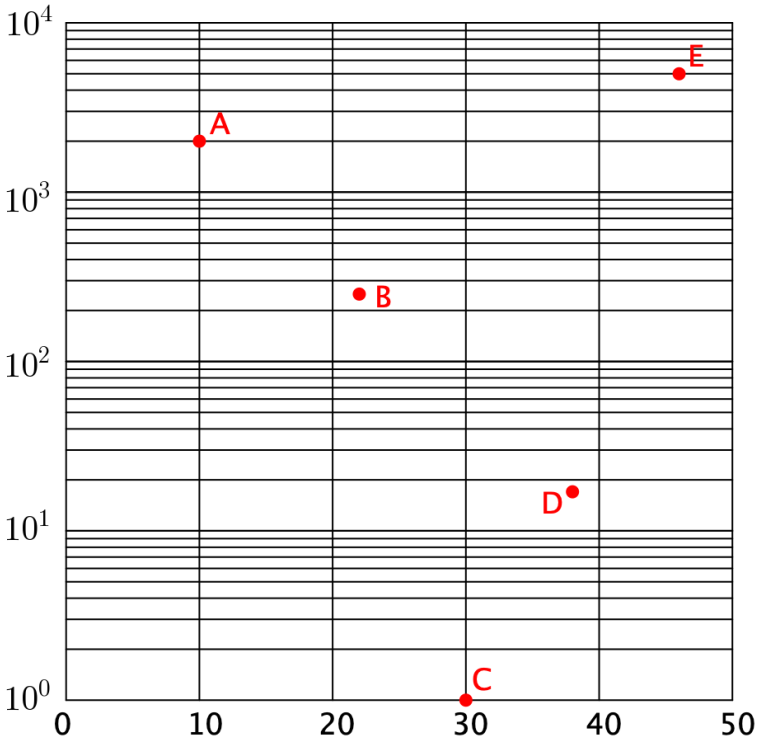


1. Plot the following points on the same coordinate plane above.

$\mathbf{A}(0, 5)$ $\mathbf{B}(1, 300)$ $\mathbf{C}(2, 20)$ $\mathbf{D}(3,\ 150)$ $\mathbf{E}(4,\ 100)$



2. Plot the following points on the same coordinate plane above.

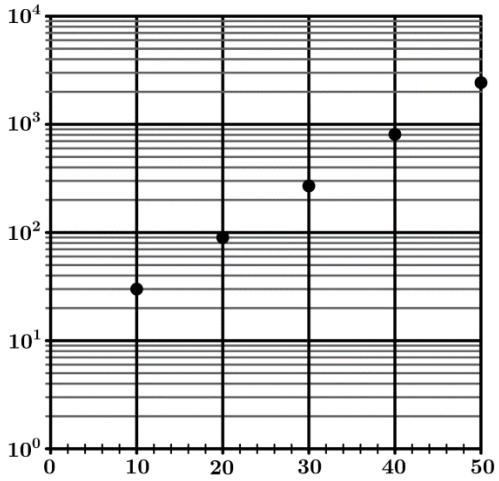
$\mathbf{A}(10,\ 2000)$ $\mathbf{B}(22,\ 250)$ $\mathbf{C}(30,\ 1)$ $\mathbf{D}(38,\ 17)$ $\mathbf{E}(46,\ 5000)$

Solutions by Ted Gott tedg20776@gmail.com

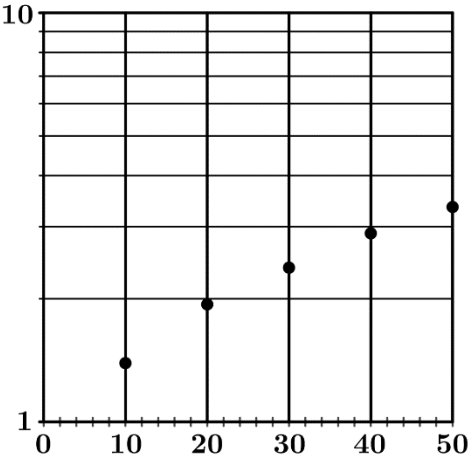
x	10	20	30	40	50
$g(x)$	30	90	270	810	2430

3. The table above gives selected values for the function g. Which of the following graphs could represent these data in a

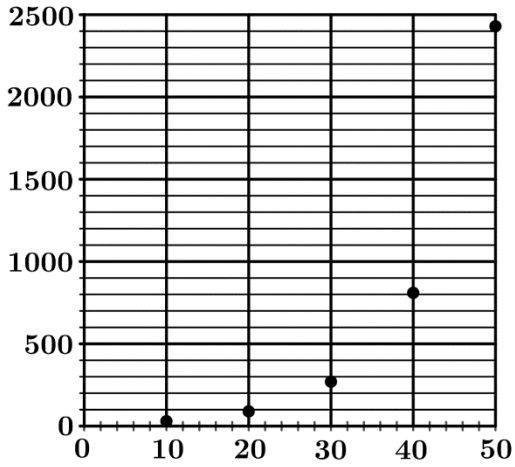
(A)



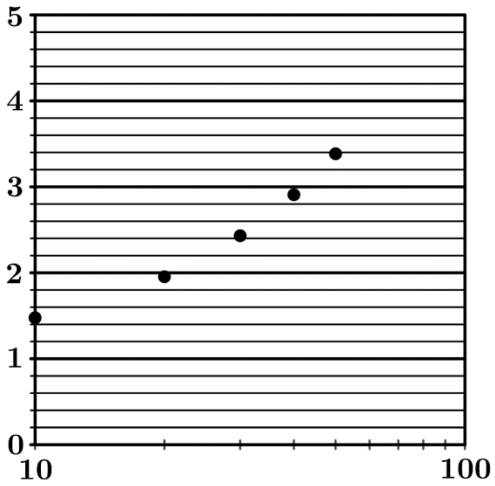
(B)



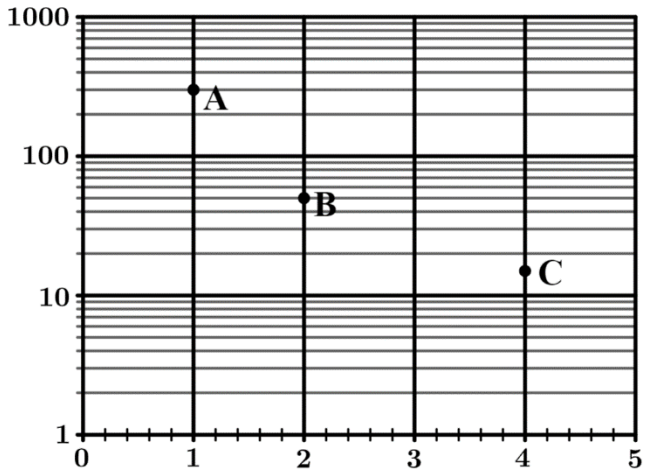
(C)



(D)



semi-log plot, where the vertical axis is logarithmically scaled?



Directions: The points A, B, and C are plotted on the semi-log plot above, where the vertical axis has been logarithmically scaled. Use the semi-log plot above to answer the following questions.

4. The coordinates of point A are most likely…

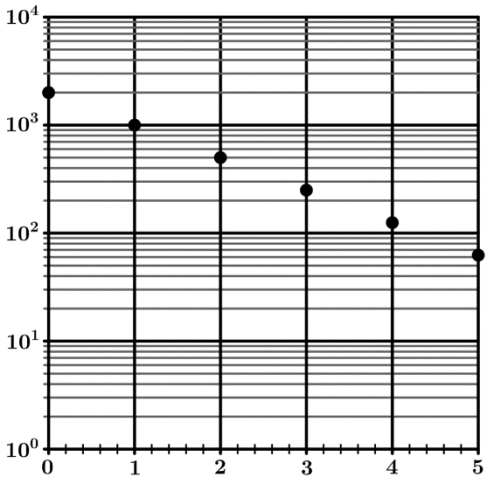
(A) $(1, 2.3)$ (B) $(1, 120)$ (C) $(1, 300)$ (D) $(1, 320)$ (E) $(10, 300)$

5. The coordinates of point B are most likely…

(A) $(2, 1.5)$ (B) $(2, 14)$ (C) $(2, 50)$ (D) $(2, 54)$ (E) $(100, 50)$

6. The coordinates of point C are most likely…

(A) $(4, 10.5)$ (B) $(4, 15)$ (C) $(4, 16.6)$ (D) $(4, 66)$ (E) $(10000, 16.6)$

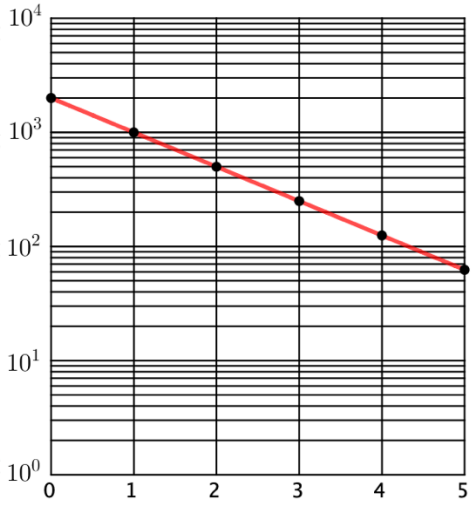


7. The function f is graphed on the semi-log plot above where the vertical axis has been logarithmically scaled. Which of the following functions could be a model for f?

(A) $f(x) = 2000 - 1000x$ (B) $f(x) = 2000 - \left(\frac{1}{2}\right)^x$ (C) $f(x) = 2000\left(\frac{1}{2}\right)^x$ (D) $f(x) = 2000(2)^x$

x	0	1	2	3	4	5
$f(x)$	2000	1000	500	250	125	62.5

These are the points on the semi-log plot.

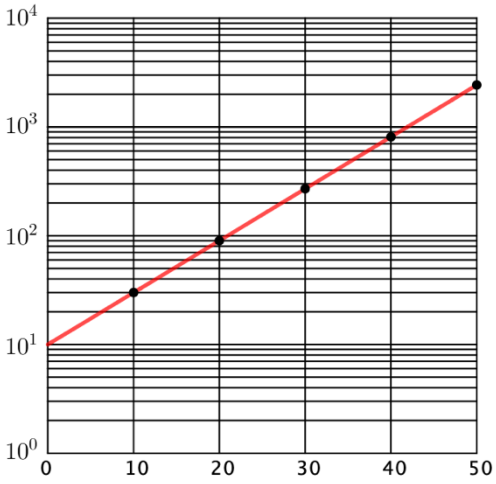


8. The function f is graphed on the semi-log plot above where the vertical axis has been logarithmically scaled. Write an equation for the linear model for the semi-log plot of the form $y = (\log_n b)x + \log_n a$.

x	0	1	2	3	4	5
$f(x)$	2000	1000	500	250	125	62.5
$\log f(x)$	$\log(2000)$	$\log(1000)$	$\log(500)$	$\log(250)$	$\log(125)$	$\log(62.5)$

$$AROC = \frac{\log(1000) - \log(2000)}{1 - 0} = \log\left(\frac{1}{2}\right) \qquad y = \left(\log\left(\frac{1}{2}\right)\right)x + \log(2000)$$

x	10	20	30	40	50
$g(x)$	30	90	270	810	2430



9. The semi-log plot above corresponds to the data table for the function g.

a) Write an equation for the linear model for the semi-log plot of the form $y = (\log_n b)x + \log_n a$.

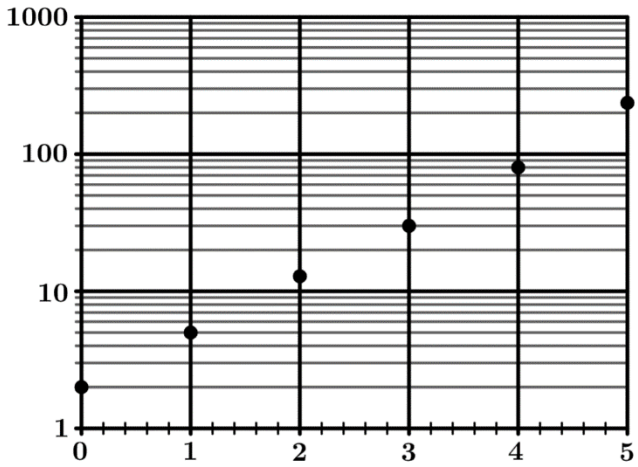
$$AROC = \frac{\log(90) - \log(30)}{20 - 10} = \frac{1}{10}\log(3) \qquad \log y = \left(\frac{1}{10}\log(3)\right)x + b \rightarrow \log 30 = \left(\frac{1}{10}\log(3)\right)(10) + b$$

$$\rightarrow \log 30 - \log 3 = b \rightarrow b = \log\left(\frac{30}{3}\right) \rightarrow b = \log 10$$

b) Using the linear model from part a, write the equation of the exponential model $y = ab^x$ for this data.

$$\log y = \left(\frac{1}{10}\log(3)\right)x + \log(10) \rightarrow \log y = (\log(3))\frac{x}{10} + \log(10) \rightarrow \log y = \log\left[3^{\frac{x}{10}}\right] + \log(10)$$

$$\rightarrow \log y = \log\left[10\left(3^{\frac{x}{10}}\right)\right] \rightarrow y = 10(3)^{x/10}$$

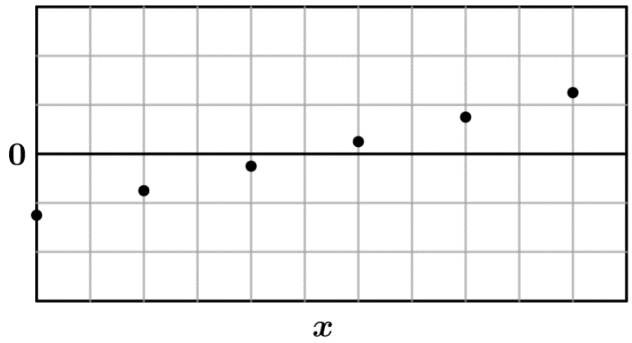


10. A group of students in Mr. Passwater's class graphed a set of data consisting of the six points shown on the semi-log plot above, where the vertical axis is logarithmically scaled. Then, they used the data to create an exponential regression model of the form function $y = ab^x$, where a and b are constants.

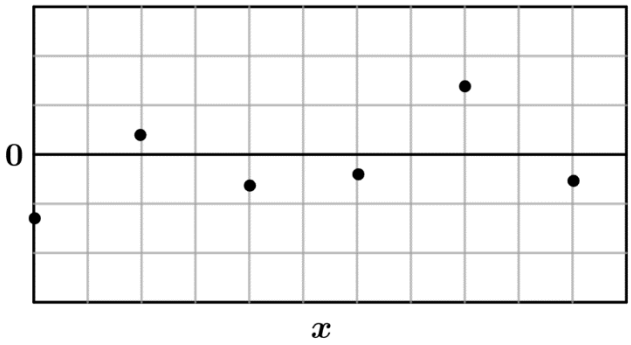
Which of the following is most likely to be the residual plot from their model?

The linear pattern in the semi-log plot suggests that an exponential model is appropriate so the residual plot should have a random pattern.

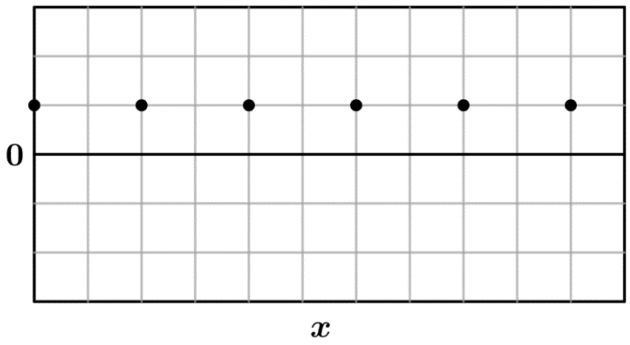
(A)



(B)



(C)



(D)