AP Precalc

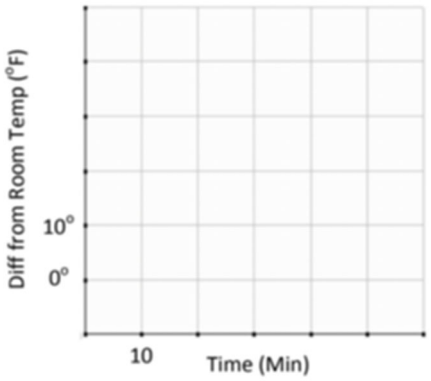
Write your questions and thoughts here!

2.15 Semi-Log Plots

2.15 Notes

When Sully is ready to retire, he has plans on moving to New York City to become a butcher. In fact, he wants to open his own butcher shop, "The New York Metzgerei," where he can sell his signature product: **Sullamy Picante**! Sully has to cook the meat and then let it cool while recording the temperature during the production process. One day, Sully observes the following temperatures:

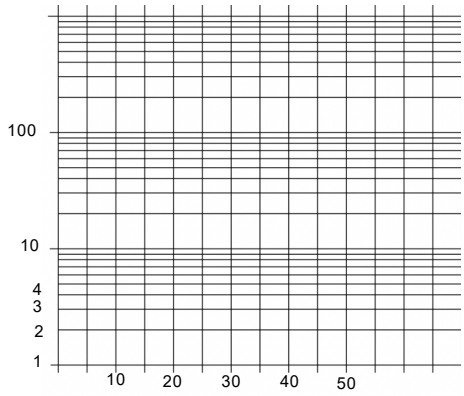
Time (min)	10	14	20	22	26	30	36	40	42	44
Temperature (degrees above room temp in °F)	51	41	30	26	21	17	11	8	6	5



What type of function does this model?

Semi-Log Plot:

Log Scale goes:



What happens to an exponential function on semi-log graph?

Find a regression equation to model the above exponential function:

Take the log and rewrite the equation. What kind of function do you have now?

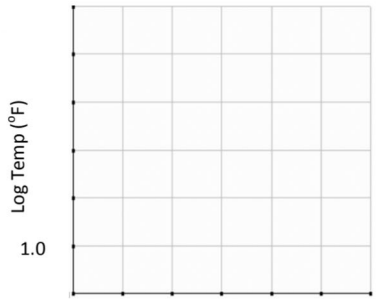
Complete the table:

Time (min)	10	14	20	22	26	30	36	40	42	44
Log (Temp)										

To "straighten" the data, take the common log of each of the temperatures. (Log $L_2 \rightarrow L_3$)

Plot the new graph. What do you notice?

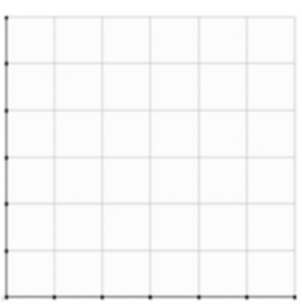
Find a linear regression model of the new data.



Write your questions and thoughts here!

Ex 1: Plot on the normal graph and on the semi-log graph. Is the data exponential? How do you know? If it is exponential, find a regression equation for the data.

x	2	3	5	7	8
Y	10.1	21.3	93.9	414.3	869.9



x	2	3	5	7	8
Y	10.1	21.3	93.9	414.3	869.9
Log y					

Complete the table to find log y, then find a linear regression model of (x, log y).

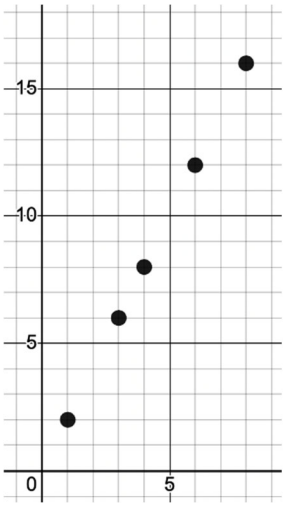
2.15 Semi-Log Plots

AP Precalculus

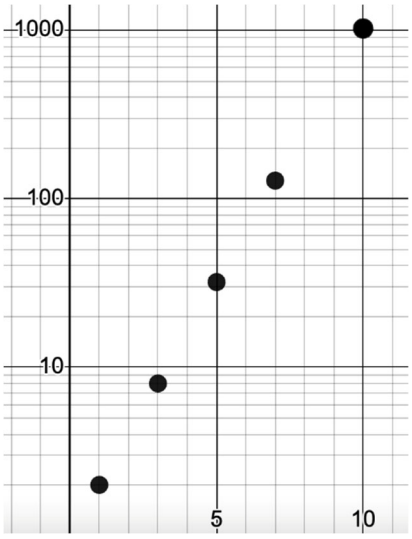
2.15 Practice

Tell which graphs represent exponential functions and which do not. Then explain why.

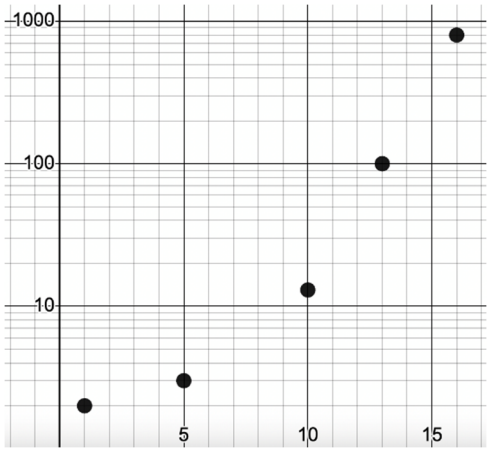
1.



2.



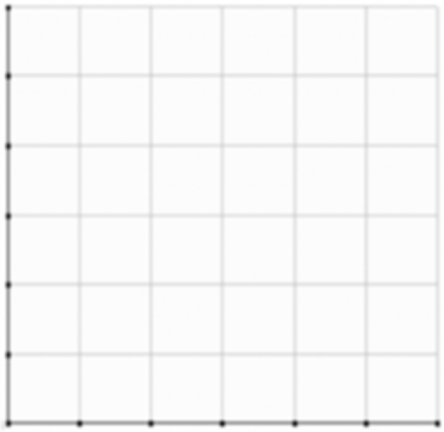
3.

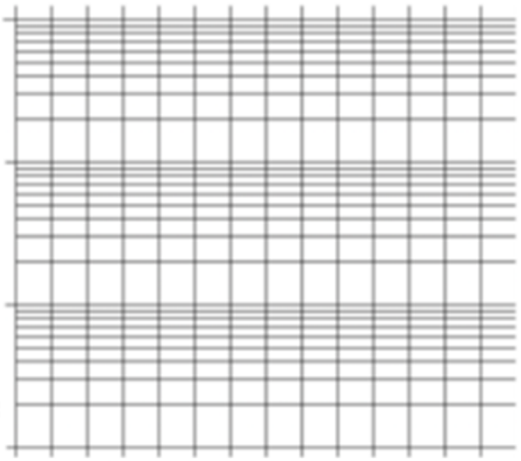


CALCULATOR ACTIVE. Answer the questions pertaining to the given data.

4. a. Plot the following data on both graphs below.

x	2	4	5	8	9
y	7	15	23	77	115





b. Find a regression equation for the above data.

c. Take the log of both sides and use log rules to create a linear function.

d. Complete the table to find $\log y$.

x	2	4	5	8	9
y	7	15	23	77	115
$\log y$					

e. Find a linear regression equation for $(x, \log y)$.

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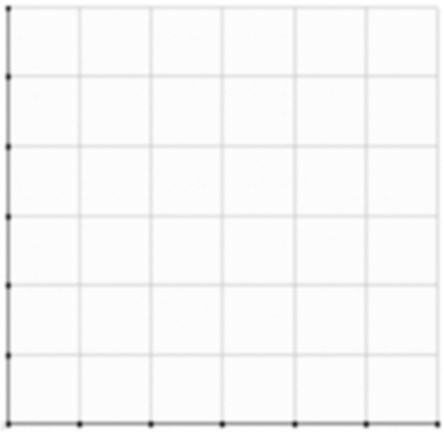
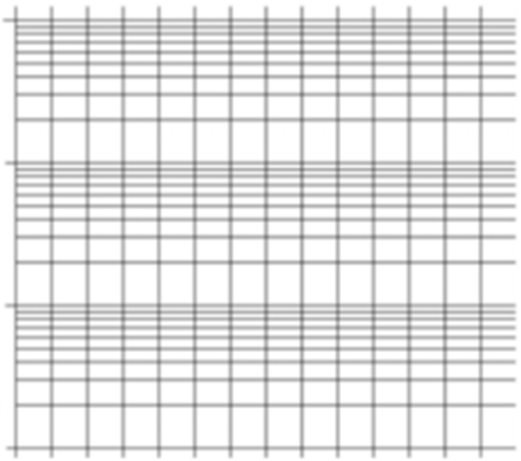
5. a. Plot the following data on both graphs below.

x	1	3	4	5	7
y	65.0	32.5	16.3	8.2	1.0





b. Find a regression equation for the above data.

c. Take the log of both sides and use log rules to create a linear function.

d. Complete the table to find $\log y$.

x	1	3	4	5	7
y	65.0	32.5	16.3	8.2	1.0
$\log y$					

e. Find a linear regression equation for $(x, \log y)$.

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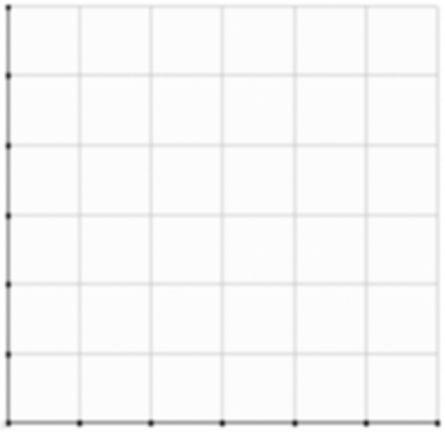
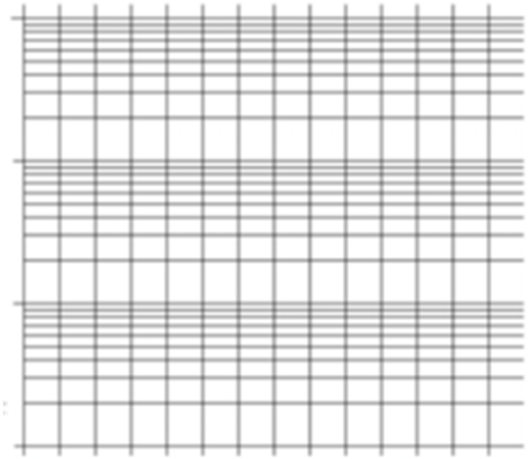
6. a. Plot the following data on both graphs below.

x	1	3	4	5	7
y	10.5	46.3	97.2	204.2	900.5





b. Find a regression equation for the above data.

c. Take the log of both sides and use log rules to create a linear function.

d. Complete the table to find $\log y$.

x	1	3	4	5	7
y	10.5	46.3	97.2	204.2	900.5
$\log y$					

e. Find a linear regression equation for $(x, \log y)$.

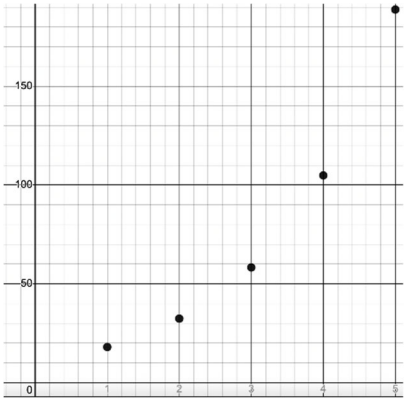
2.15 Semi-Log Plots

2.15 Test Prep

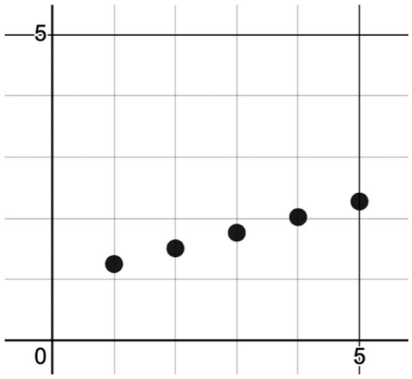
7. The table gives values for a function f at selected values of m. Which of the following graphs could represent these data in a semi-log plot where the vertical axis is logarithmically scaled.

m	1	2	3	4	5
$f(m)$	18	32.4	58.3	104.9	188.9

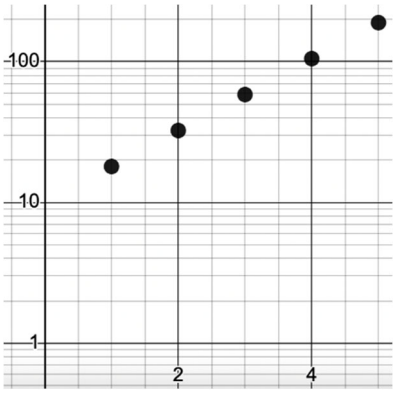
(A)



(B)



(C)



(D)