

Honors Algebra II

Notes Section 4.7

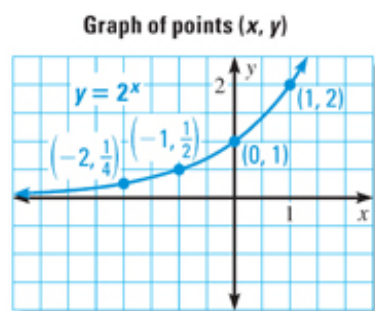
Write and Apply Exponential and Power Functions

Example 1 Write an exponential function $y = ab^x$ whose graph passes through (1, 12) and (3, 108).

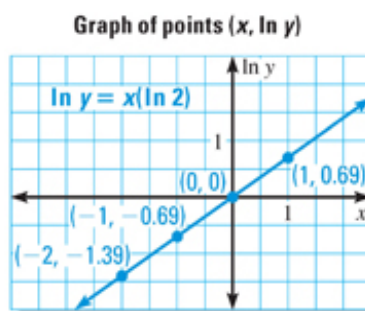
STEPS

1. Substitute both points into exponential function
2. Solve for a in the 1st equation, substitute the result into the 2nd equation
3. Substitute a & b into $y = ab^x$

TRANSFORMING EXPONENTIAL DATA: a set of more than 2 points fits an exponential pattern if and only if the set of transformed points $(x, \ln y)$ fits a linear pattern.



The graph is an exponential curve.



The graph is a line.

Example 2

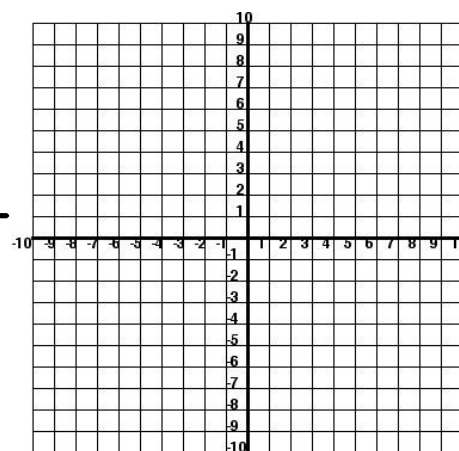
x	1	2	3	4	5	6	7
y	12	16	25	36	50	67	96

STEPS

1. Draw a scatter plot of the data (x, ln y).

Is an exponential model a good fit?

x	1	2	3	4	5	6	7
y							



2. Plot the points

3. Find an exponential model $y = ab^x$.

****choose 2 points on the line to find the slope****

****Use the point slope formula to find the model**

Example 3 Repeat Example 2 using a graphing calculator. Predict y if $x = 8$.

STEPS

1. Enter data into List 1 and List 2
2. Perform an exponential regression _____
3. Substitute $x = 8$ into the exponential function _____

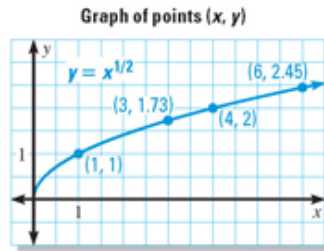
Power Function: $y = ax^b$

Example 4 Write a power function $y = ax^b$ whose graph passes through (3, 2) and (6, 9).

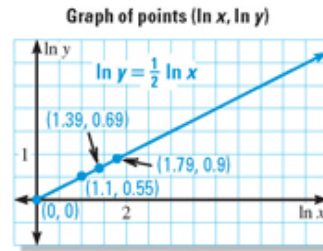
STEPS

1. Substitute both points into power function
2. Solve for a in the 1st equation, substitute the result into the 2nd equation
3. Substitute a & b into $y = ax^b$

TRANSFORMING POWER DATA: a set of more than 2 points fits a power pattern if and only if the set of transformed points $(\ln x, \ln y)$ fits a linear pattern.



The graph is a power curve.



The graph is a line.

Example 5

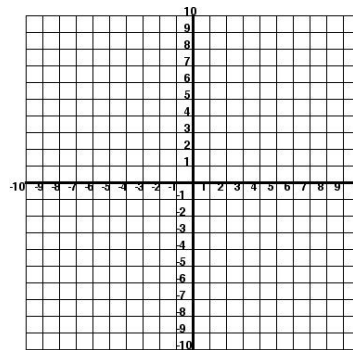
x	1.9	2.92	3.41	5.35	8.40
y	0.23	1.04	1.69	6.76	16.03

STEPS

1. Draw a scatter plot of the data $(\ln x, \ln y)$.

Is a power model a good fit?

x					
y					



2. Plot the points

3. Find an exponential model $y = ax^b$.

****choose 2 points on the line to find the slope****

****Use the point slope formula to find the model**

Example 3 Repeat Example 5 using a graphing calculator. Predict y if $x = 4.5$

STEPS

1. Enter data into List 1 and List 2
2. Perform a power regression _____
3. Substitute $x = 4.5$ into the power function _____