

# Exponential Regression Notes and Example

Name \_\_\_\_\_

Class Period \_\_\_\_\_

The form of an exponential equation is:  $y = ab^x$  → Growth or Decay Factor  
 ↓ (1+r) (1-r)  
 initial value

Generate a best fit exponential function for the following data:  $r = \text{rate}$

② Pick 2 coordinate (Pick 1 coordinate with x-value of 0)  
 $(0, 34.7)$   $(3, 297.6)$   
 x y x y

Years ①	Salary (thousands)
2000 0	34.7
2001 1	50.1
2002 2	178.9
2003 3	297.6
2004 4	400.8

③ Write 2 equations ( $y = ab^x$ )

$$34.7 = ab^0$$

$$34.7 = a(1)$$

$$34.7 = a$$

④ solve for a

$$297.6 = ab^3$$

$$\frac{297.6}{34.7} = \frac{34.7}{34.7} b^3$$

$$\sqrt[3]{8.58} = \sqrt[3]{b^3}$$

$$2.05 = b$$

⑤ Plug "a" into 2nd equation & solve for b.

⑥ Write your equation ( $y = ab^x$ )

$$y = 34.7(2.05)^x$$

initial value? 34.7

Growth or DECAY?

Growth Factor? 2.05

$b = (1+r)$   
 Growth rate?

$$1+r = 2.05$$

$$r = 1.05$$

105%

Generate an exponential function of best fit for the following data.

X	0	2	5	7	10	13	16	20	26
Y	14	29	36	58	124	189	257	349	567

\*\*\*\*\* Use (0, 14) and (10, 124) if you don't have a calculator

$$14 = ab^0$$

$$14 = a(1)$$

$$a = 14$$

$$124 = ab^{10}$$

$$\frac{124}{14} = \frac{14b^{10}}{14}$$

$$\sqrt[10]{8.86} = \sqrt[10]{16}$$

$$1.24 = b$$

$$y = 14(1.24)^x$$

Find an exponential regression equation for the following data.

X	0	2	5	7	10	13	16
Y	72	36	15	4	.8	.03	.002

\*\*\*\*\* Use (0, 72) and (7, 4) if you don't have a calculator