

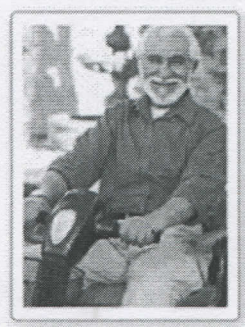
6.7 Modeling Exponential & Logarithmic Functions DAY ONE CYU

H = (Hand)
C = (calc)

- Use when you get it right all by yourself
- S** Use when you did it all by yourself, but made a silly mistake
- H** Use when you could do it alone with a little help from teacher or peer
- G** Use when you completed the problem in a group
- X** Use when a question was attempted but wrong (get help)
- N** Use when a question was not even attempted

CONCEPTS	BASIC	INTERMEDIATE	ADVANCED
Real-World Application			1 - 6
Exponential Regression		1 - 4	
Using models to predict		5 - 6	

1. **MODELING WITH MATHEMATICS** A store sells motorized scooters. The table shows the numbers y of scooters sold during the x th year that the store has been open. Write a function that models the data.



$$y = 7.20 (1.39)^x \quad (H)$$
 or

$$y = 6.703 (1.405)^x \quad (C)$$

x	y
1	9
2	14
3	19
4	25
5	37
6	53
7	71

2. **MODELING WITH MATHEMATICS** The table shows the numbers y of visits to a website during the x th month. Write a function that models the data. Then use your model to predict the number of visits after 1 year.

$$(H) \quad y = 12.26 (1.79)^x \approx 13,266$$
 or

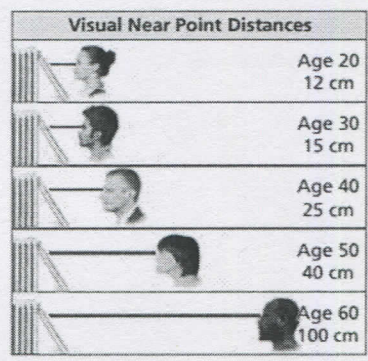
$$(C) \quad y = 12.143 (1.796)^x \approx 13,677$$

x	1	2	3	4	5	6	7
y	22	39	70	126	227	408	735

3. **MODELING WITH MATHEMATICS** Your visual near point is the closest point at which your eyes can see an object distinctly. The diagram shows the near point y (in centimeters) at age x (in years). Write an exponential model for original data.

$$(H) \quad y = 3.25 (1.052)^x$$

$$(C) \quad y = 3.4995 (1.0536)^x$$



4. **USING TOOLS** A doctor measures an astronaut's pulse rate y (in beats per minute) at various times x (in minutes) after the astronaut has finished exercising. The results are shown in the table. Use a graphing calculator to find an exponential model for the data. Then use the model to predict the astronaut's pulse rate after 16 minutes.

x	y
0	172
2	132
4	110
6	92
8	84
10	78
12	75



$$(c) \quad y = 153.07 (0.93)^x \\ \approx 48 \text{ b/m}$$

5. **USING TOOLS** An object at a temperature of 160°C is removed from a furnace and placed in a room at 20°C . The table shows the temperatures d (in degrees Celsius) at selected times t (in hours) after the object was removed from the furnace. Use a graphing calculator to find a logarithmic model (STAT, CALC, 9: LnReg) of the form $t = a + b \ln d$ that represents the data. Estimate how long it takes for the object to cool to 50°C .

d	160	90	56	38	29	24
t	0	1	2	3	4	5

$$(c) \quad t = 12.59 - 2.55 (\ln d) \\ \approx 2.6 \text{ h}$$

6. **USING TOOLS** The f -stops on a camera control the amount of light that enters the camera. Let s be a measure of the amount of light that strikes the film and let f be the f -stop. The table shows several f -stops on a 35-millimeter camera. Use a graphing calculator to find a logarithmic model of the form $s = a + b \ln f$ that represents the data. Estimate the amount of light that strikes the film when $f = 5.657$.

f	s
1.414	1
2.000	2
2.828	3
4.000	4
11.314	7



$$s = 0.000398 + 2.89 (\ln f) \\ \approx 5 \text{ units of light}$$

CYU Reflection: How far can you go: basic, intermediate, or advanced?

Rate your mastery level!

How confident are you with the skills this CYU covered? Circle the score you would give yourself.

● ● ● ● ● ● ●

1	2	3	4	5	6	7	8
Basic		Intermediate			Advanced		Solved ALL!

