Name _____ Date _____ Pd ____

6.7 Modeling Exponential & Logarithmic Functions DAY ONE CYU

☑ 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 xth year that the store has been open. Write a function that models the data.
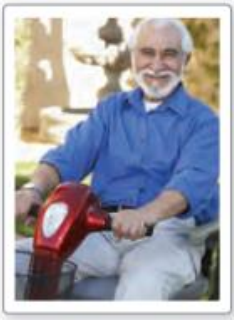
x	y
1	9
2	14
3	19
4	25
5	37
6	53
7	71

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

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.

Visual Near Point Distances

Age 20 — 12 cm
Age 30 — 15 cm
Age 40 — 25 cm
Age 50 — 40 cm
Age 60 — 100 cm
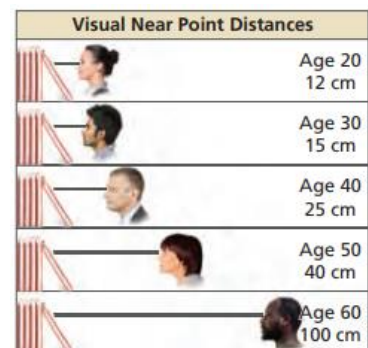
4. **USING TOOLS** A doctor measures an astronaut's pulse rate y (in beats per minute) at various times x (in minutes) after the astronaut has finished exercising. The results are shown in the table. Use a graphing calculator to find an exponential model for the data. Then use the model to predict the astronaut's pulse rate after 16 minutes.

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

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

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-milimeter 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

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! |