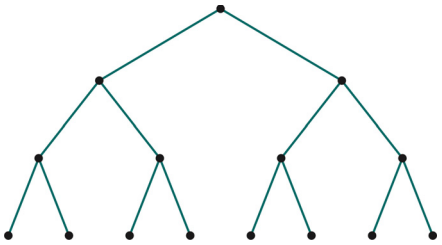
Lesson 2: Investigation 1—Applications Task 1 (p. 338)
Investigation 2—Applications Task 6 (p. 340), Connections Task 20 (p. 345)
Investigation 4—Applications Task 12 (p. 343), Applications Task 13 (p. 343), Applications Task 16 (p. 344), Connections Task 22 (p. 346)
Investigation 5—Applications Task 17 (p. 344), Extensions Task 35 (p. 351)

Selected Homework Tasks and Expected Solutions

(These solutions are for tasks in the 2nd edition book—2008 copyright.
For homework tasks in books with earlier copyright dates, see Helping with Homework.)

Lesson 1, Investigation 1, Applications Task 2 (p. 307)

a. The vertices in the graph at the right represent the families placing/receiving calls, and the edges represent the phone calls.



b. Students should fill in the missing table entries.

Stage of Calling Tree	1	2	3	4	5	6	7	8	9	10
Number of Calls Made	2					64				1,024

c. Rules should be in the forms:

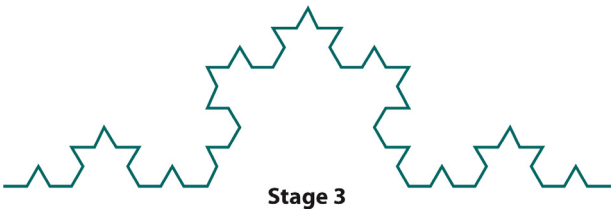
- $NEXT = b \cdot NOW$, starting at ____
- $y = b^x$

d. To be completed by the student.

Hint: This question is *not* asking when the number of calls at a stage reaches 750.

Lesson 1, Investigation 1, Connections Task 18 (p. 313)

a.



There is one vertical line of symmetry through the center of the whole figure.

Hint: To make the sketch of Stage 3, it may help to think of it this way: Look at each segment of Stage 2 and put a "hat" ∧ on it.

b. To be completed by the student.

c. Rules should be in the form $NEXT = b \bullet NOW$, starting at ____.

d. Rules should be in the form $y = b^x$.

e. To be completed by the student. Students do *not* need to write out a table for the 15 stages but should include a graph.

Lesson 1, Investigation 2, Applications Task 6 (p. 309)

a. The first entry in the table should be as shown. The rest of the table is to be completed by the student.

10-min Periods	0	1	2	3	4	5	6
Bacteria Count	50						

b. To be completed by the student.

c. 13,107,200 bacteria

Lesson 1, Investigation 2, Connections Task 20 (p. 314)

a. To be completed by the student.

b. After the 8th stage, 510 total families will have been called. Because each stage takes 40 seconds, after 8 stages, 5 minutes and 20 seconds will have passed. This still leaves 240 families to be called. If 240 out of the last 256 newly informed families make 1 call, the whole club can be informed in 20 additional seconds to make a total time needed of 5 minutes and 40 seconds.

Lesson 1, Investigation 3, Applications Task 8 (p. 309)

a. Student should fill in the missing table entries.

Years After 2000	0	1	2	3	4	5	6	7	8	9	10
AIDS Cases (in millions)				54.8	63.0				110.1		

b. To be completed by the student.

c. The model estimates that about 293 million people will be living with HIV/AIDS in the year 2015.

d. To be completed by the student.

Lesson 1, Investigation 3, Extensions Task 32 (p. 318)

a. With quarterly compounding of 1%, after 5 years the account will have a value of $1,220.19.

Hint: This can be found by using the function $y = 1{,}000(1.01^x)$, where x is the number of times compounded. In this situation, $x = 20$ because you are compounding quarterly for 5 years. Alternatively, you could look at the table or use the graph.

b. To be completed by the student.

c. To be completed by the student.

Lesson 1, Investigation 4, Applications Task 10 (p. 310)

These data are located in *CPMP-Tools* under Statistics, Data Analysis, Data>Unit 5 Exponential Functions> Dow Jones Averages.

a. To be completed by the student.

Hint: After you make a scatterplot of the data, you can find both linear and exponential functions under the Models menu. The equations of the models can be found under the Options menu by selecting Show Equation(s).

b. To be completed by the student.

c. To be completed by the student.

Lesson 1, Investigation 4, Applications Task 11 (p. 311)

These data are located in *CPMP-Tools* under Statistics, Data Analysis, Data>Unit 5 Exponential Functions> Voters in U.S. Elections.

Lesson 1, Investigation 5, Applications Task 13 (p. 311)

a, c, d, f. To be completed by the student.

b. $y = 10$

e. Any combination of w and x adding to 6

Lesson 1, Investigation 5, Applications Task 14 (p. 312)

a. 7^{13}

b–e, g, h. To be completed by the student.

f. $7a^3b^5m^7$

Lesson 1, Investigation 5, Applications Task 15 (p. 312)

a. $z = 10$

b. $x = 4.5$

c. $x = 4$

d–h. To be completed by the student.

Lesson 2, Investigation 1, Applications Task 1 (p. 338)

a. Student should fill in the missing table entries.

x	0	1	2	3	4	5
y	10	5				$\frac{5}{16}$

b. The fourth bounce will be less than 1 foot (seen in the table). This is the plot point that rises to a y-coordinate less than 1.

c. $NEXT = \frac{1}{2} NOW$, starting at 10; $y = 10\left(\frac{1}{2}\right)^x$, where x is the number of bounces.

d. To be completed by the student.

e. To be completed by the student.

Lesson 2, Investigation 2, Applications Task 6 (p. 340)

a. The distributive property guarantees the identity:

$$\begin{aligned} x - 20\%x &= x - 0.2x \\ &= (1 - 0.2)x \\ &= 0.8x \\ &= 80\%x \end{aligned}$$

You can calculate depreciated values by calculating 80% of the value of the truck, or by calculating 20% of the truck value and subtracting that amount from the truck value.

b. To be completed by the student.

Hint: There are two correct forms of the *NOW-NEXT* rule. The "$y = \ldots$" should be in the form $y = ab^x$, where x is the number of years after purchase.

c. To be completed by the student.

The student should include a picture of the graph in their answer with appropriate labels. The answer to the question can be estimated using the trace function on their calculator or, alternatively, they can graph their "$y = \ldots$" equation from Part b along with the equation $y = 1{,}000$ and find the intersection of these two functions.

d. To be completed by the student.

Lesson 2, Investigation 2, Connections Task 20 (p. 345)

a. Exponential decay function

b, d, f–i, k, l. To be completed by the student.

c. Exponential growth function

e. Neither linear nor exponential function

j. Increasing linear function

Lesson 2, Investigation 4, Applications Task 12 (p. 343)

a. $x = \frac{125}{64}$

b–d. To be completed by the student.

Lesson 2, Investigation 4, Applications Task 13 (p. 343)

a. $\frac{16x^2}{n^2}$

b, c. To be completed by the student.

Lesson 2, Investigation 4, Applications Task 16 (p. 344)

a. $4.5^{-2} = ((4.5)^{-1})^2 = \left(\frac{1}{4.5}\right)^2 = \frac{1^2}{4.5^2} = \frac{1}{4.5^2}$

b–h. To be completed by the student.

Lesson 2, Investigation 4, Connections Task 22 (p. 346)

a. **i.** 2.3456789×10^8

b. **i.** 2.34×10^{-2}

c. **i.** 782,000,000

All other parts to be completed by the student.

Lesson 2, Investigation 5, Applications Task 17 (p. 344)

a. 7

b–d, f–h. To be completed by the student.

e. 12

Lesson 2, Investigation 5, Extensions Task 35 (p. 351)

i. $\left(3^{\frac{1}{4}}\right)^4 = 3^1 = 3$

a. $b^{\frac{1}{4}}$ is the number multiplied by itself 4 times that results in b. Another way to say this is that $b^{\frac{1}{4}}$ is the number that when it is raised to the fourth power is b, or the fourth root of b; $\left(b^{\frac{1}{4}}\right)^4 = b$.

The remainder of the task is to be completed by the student.

