

## Module 4 Topic F Lesson 20-22 Student Copy

### Exercises

#### Lesson 20

1. In New York State, there is a five-cent deposit on all carbonated beverage cans and bottles. When you return the empty can or bottle, you get the five cents back.
  - a. Complete the table.

Number of Containers Returned	Refund in Dollars
1	
2	
3	
4	
10	
50	
100	
$C$	

- b. If we let  $C$  represent the number of cans, what is the expression that shows how much money is returned?
- c. Use the expression to find out how much money Brett would receive if he returned 222 cans.
- d. If Gavin needs to earn \$4.50 for returning cans, how many cans does he need to collect and return?
- e. How is part (d) different from part (c)?

## Lesson 21

The Italian Villa Restaurant has square tables that the servers can push together to accommodate the customers. Only one chair fits along the side of the square table. Make a model of each situation to determine how many seats will fit around various rectangular tables.



Number of Square Tables	Number of Seats at the Table
1	
2	
3	
4	
5	
50	
200	
$T$	

Are there any other ways to think about solutions to this problem?

It is impractical to make a model of pushing 50 tables together to make a long rectangle. If we did have a rectangle that long, how many chairs would fit on the long sides of the table?

How many chairs fit on the ends of the long table?

How many chairs fit in all? Record it on your table.

## Lesson 22

1. Predict how many times you can fold a piece of paper in half.

My prediction: \_\_\_\_\_

2. Before any folding (zero folds), there is only one layer of paper. This is recorded in the first row of the table. Fold your paper in half. Record the number of layers of paper that result. Continue as long as possible.

Number of Folds	Number of Paper Layers That Result	Number of Paper Layers Written as a Power of 2
0	1	$2^0$
1		
2		
3		
4		
5		
6		
7		
8		

- a. Are you able to continue folding the paper indefinitely? Why or why not?

## Homework

### Problem Set

1. A radio station plays 12 songs each hour. They never stop for commercials, news, weather, or traffic reports.
  - a. Write an expression describing how many songs are played by the radio station in  $H$  hours.
  - b. How many songs will be played in an entire day (24 hours)?
  - c. How long does it take the radio station to play 60 consecutive songs?

### Problem Set

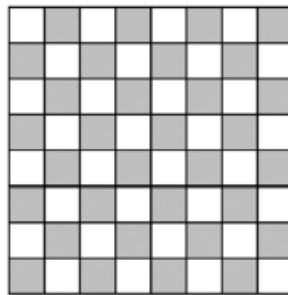
- Compact discs (CDs) cost \$12 each at the Music Emporium. The company charges \$4.50 for shipping and handling, regardless of how many compact discs are purchased.
  - Create a table of values that shows the relationship between the number of compact discs that Mickey buys,  $D$ , and the amount of money Mickey spends,  $C$ , in dollars.

Number of CDs Mickey Buys ( $D$ )	Total Cost in Dollars ( $C$ )
1	
2	
3	

- If you know how many CDs Mickey orders, can you determine how much money he spends? Write the corresponding expression.
- Use your expression to determine how much Mickey spent buying 8 CDs.

### Problem Set

- A checkerboard has 64 squares on it.



- If one grain of rice is put on the first square, 2 grains of rice on the second square, 4 grains of rice on the third square, 8 grains of rice on the fourth square, and so on (doubling each time), complete the table to show how many grains of rice are on each square. Write your answers in exponential form on the table below.

Checkerboard Square	Grains of Rice	Checkerboard Square	Grains of Rice	Checkerboard Square	Grains of Rice	Checkerboard Square	Grains of Rice
1		17		33		49	
2		18		34		50	
3		19		35		51	
4		20		36		52	
5		21		37		53	
6		22		38		54	
7		23		39		55	
8		24		40		56	
9		25		41		57	
10		26		42		58	
11		27		43		59	
12		28		44		60	
13		29		45		61	
14		30		46		62	
15		31		47		63	
16		32		48		64	

- b. How many grains of rice would be on the last square? Represent your answer in exponential form and standard form. Use the table above to help solve the problem.
- c. Would it have been easier to write your answer to part (b) in exponential form or standard form?