

LESSON **Problem Solving**
12-1 **Geometric Sequences**

Write the correct answer.

1. A ball is dropped from 400 feet. The table shows the height of each bounce.

Bounce	Height (ft)
1	280
2	196
3	137.2

Find the height of the ball on the 6th bounce. Round your answer to the nearest tenth of a foot.

$$a_6 = 280 \left(\frac{7}{10}\right)^{6-1} = 47.059 \text{ ft}$$

3. Jeanette started selling bagels to offices in her area. Her sales for the first 3 months are shown in the table.

Month	Sales (\$)
1	\$200.00
2	\$230.00
3	\$264.50

If this trend continues, find the amount of Jeanette's sales in Month 8.

$$a_8 = 200 \left(\frac{230}{200}\right)^{8-1} = \$532.00$$

The table shows the number of houses in a new subdivision. Use the table to answer questions 4-7. Select the best answer.

Month	Houses
1	3
2	6
3	12
4	24

4. The number of houses forms a geometric sequence. What is r ?

A 0.5 C 3

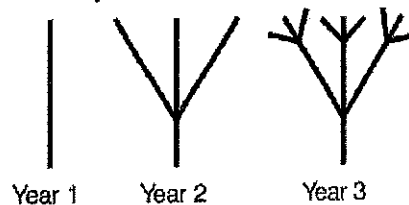
$r =$ **(B) 2** D 6

5. Assuming that the trend continues, how many houses would be in the subdivision in Month 6?

F 36 H 60

G 48 **(J) 96**

2. A plant starts with 1 branch. Every year, each branch becomes 3 branches. A sketch of the plant for the first 3 years is shown. How many branches will the plant have in year 10?



$$a_{10} = 1(3)^{10-1} = 19,683 \text{ branches}$$

How many branches would the plant have in year 10 if the plant had 5 branches the first year? (Each branch still becomes 3 branches every year.)

$$a_{10} = 5(3)^{10-1} = 98,415 \text{ branches}$$

6. Management decides the subdivision is complete when the number of houses reaches 48. When will this happen?

(A) Month 5 C Month 7
B Month 6 D Month 8

7. Suppose the number of houses tripled every month. How many more houses would be in the subdivision in Month 4? (The number of houses in Month 1 is still 3.)

F 48 H 72
(G) 57 J 81
 $\times 2$ $\times 3$
Month 4: 24 81

$$81 - 24 = \text{(57)}$$

$$a_6 = 3(2)^{6-1}$$