

$$32 \div 128 = \frac{1}{4}$$

(5) Given the following geometric sequence: 128, 32, 8, 2, 0.5, ...

a) Write an equation to find the  $n$ th term.

b) Find the 8th term.  $n = \underline{\hspace{2cm}}$

★  $a_1 = 128$   $r = \frac{1}{4}$   
 $a_n = a_1 \cdot r^{n-1}$

$$a_8 = a_1 \cdot r^{8-1}$$

$$a_8 = 128 \cdot \left(\frac{1}{4}\right)^{8-1}$$

$$a_8 = 128 \cdot \left(\frac{1}{4}\right)^7$$

$$a_8 = 128 \cdot \dots$$

$$a_8 = .0078125$$

(6) Given the following geometric sequence:

$n$	1	2	3	4
$a_n$	$\frac{2}{3}$	-2	6	-18

$$6 \div -2 = -3$$

$$-2 \div \frac{2}{3} = -3$$

a) Write an equation to find the  $n$ th term.

b) Find the 7th term.

$$a_1 = \frac{2}{3}$$

$$r = -3$$

$$a_n = a_1 \cdot r^{n-1}$$

$$a_n = \frac{2}{3} \cdot (-3)^{n-1}$$

$$a_n = a_1 \cdot r^{n-1}$$

$$a_n = \frac{2}{3} \cdot (-3)^{n-1}$$

$$a_7 = \frac{2}{3} \cdot (-3)^{7-1}$$

$$a_7 = 486$$

## Conclusion!

- The ratio of successive terms in a geometric sequence is called the \_\_\_\_\_.
- The explicit formula for a geometric sequence allows you to find the  $n$ th term of the sequence by substituting the values of \_\_\_\_\_ (first term) and \_\_\_\_\_ (common ratio) in the equation  $a_n = \underline{\hspace{2cm}}$ .

Homework!

1. Find the common ratio of each of the following geometric sequences.

18 ÷ 6 =  
 a) 2, 6, 18, 54, ...  
 $r = 3$

b) 135, 45, 15, 5, ...  
 $r = \frac{1}{3}$

c) 7, -14, 28, -56, ...  
 $r = -2$

2. (a) Write an equation for the  $n$ th term of the geometric sequence.

(b) Using the equation, find  $a_6$ .

a) 3, 6, 12, 24, ...  
 $a_n = 3 \cdot (2)^{n-1}$   
 $a_1 = 3$   
 $r = 2$

$a_6 = 96$

b) 0.375, 3, 24, 192, ...  
 $a_n = 0.375 \cdot (8)^{n-1}$   
 $a_1 = 0.375$   
 $r = 8$

$a_6 = 12,288$

c) ↓

$n$	1	2	3	4
$a_n$	-1024	128	-16	2

$a_n = -1024 \cdot (-\frac{1}{8})^{n-1}$   
 $a_1 = -1024$   
 $r = -\frac{1}{8}$   
 $a_6 = .03125$