

Practice Problems

Find the common ratio of a geometric Sequence

4, 8, 16, 32...

common ratio (r) = $8/4 = 2$

256, 64, 16, 4....

common ratio (r): $64/256 = .25$ or $1/4$

Find the first 4 terms

$$a_n = 4(2)^{n-1}$$

*Substitute $n=1$, $n=2$, $n=3$, $n=4$ into the equation given.

$$4(2)^{1-1}$$



Answer: $a_1 = 4$.

$$4(2)^{2-1}$$



Answer: $a_2 = 8$.

$$4(2)^{3-1}$$



Answer: $a_3 = 16$.

$$4(2)^{4-1}$$



Answer: $a_4 = 32$

4, 8, 16,...

a. Find the 12th term of the sequence

Explicit Form:

Step 1: $a_1 = 4$; common ratio (r): $8/4 = 2$

Step 2: Come up with explicit form. $a_n = 4(2)^{n-1}$

Step 3: *substitute 12 in for n.

$$a_{12} = 4(2)^{12-1} \quad \boxed{\text{Answer: 8192}}$$

b. Find the a_8

*substitute 8 in for n.

$$a_8 = 4(2)^{8-1} \quad \boxed{\text{Answer: 512}}$$

The first term is 6 and the common ratio is -4.
Find the next 3 terms.

Step 1: $a_1 = 6$; common ratio $(r) = -4$

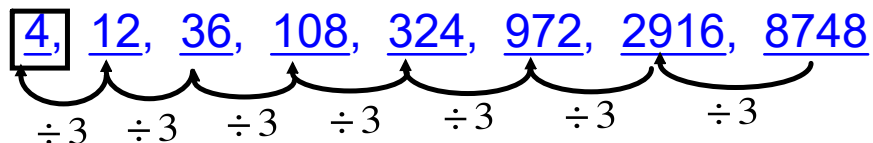
Step 2: keep multiplying the previous term by -4 to find the next term.

6, -24, 96, -384

The common ratio is 3 and the the 8th term is
8748. What is the first term?

n=1 n=2 n=3 n=4 n=5 n=6 n=7 n=8

4, 12, 36, 108, 324, 972, 2916, 8748



$\div 3$ $\div 3$ $\div 3$ $\div 3$ $\div 3$ $\div 3$ $\div 3$

It is time to call the exterminator! You found out that the number of termites under your house is tripling every week. If you have 8 termites week 1 find the following:

1. Write a rule for the growth of the termites

Step 1: Find first term and common ratio (r).

$$a_1 = 8; \text{ common ratio } (r) = \text{triple } (3).$$

Step 2: Substitute into explicit formula.

$$a_n = 8(3)^{n-1}$$

2. How many termites will you have after 8 weeks?

*substitute into the explicit formula you created.

$$a_8 = 8(3)^{8-1} \quad \boxed{\text{Answer: 17,496 termites after 8 weeks.}}$$