Geometric Sequences

Name _____

Date _____ Period _____

A geometric sequence is a sequence of successive terms that differ by a common ratio, r.

$$a_1 = a, \qquad a_n = r \cdot a_{n-1}$$

$$a_1 = 2, \qquad a_n = 3 \cdot a_{n-1}$$

$$2, \quad 6, \quad 18, \quad 54, \quad 162, \quad 486$$

$$\times 3 \quad \times 3 \quad \times 3 \quad \times 3 \quad \times 3$$

common ratio $= 3$

A geometric sequence is a sequence of successive terms that differ by a common ratio, r.

$$a_1 = a, \qquad a_n = r \cdot a_{n-1}$$

$$a_1 = 8, \qquad a_n = -\frac{1}{2} \cdot a_{n-1}$$

$$8, \quad -4, \quad 2, \quad -1, \quad \frac{1}{2}, \quad -\frac{1}{4}$$

$$\times -\frac{1}{2} \quad \times -\frac{1}{2} \quad \times -\frac{1}{2} \quad \times -\frac{1}{2} \quad \times -\frac{1}{2}$$

common ratio $= -\frac{1}{2}$

Determine if the following sequence is a geometric sequence.

$$\{a_n\} = \{2^n\}$$

Find the first five terms of $\{a_n\}$ Find a_n Find a_{n+1}

Determine if the following sequence is a geometric sequence.

$$\{a_n\} = \{3^{2n}\}$$

Find the first five terms of $\{a_n\}$ Find a_n Find a_{n+1}

The general formula of a geometric sequence

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

Find the general formula of the following geometric sequences

4, 8, 16, 32, 64, ...

243, -81, 9, -3, 1, ...

1, -1, 1, -1, 1, ...