

## 7.3

Find the common ratio for the geometric sequence. If a sequence is not geometric, say so.

1) 4, 16, 64, 256, 1024  
 A)  $1/4$                       B) 4                      C) 16                      D) Not geometric                      1) \_\_\_\_\_

2)  $\frac{4}{3}, \frac{8}{3}, \frac{16}{3}, \frac{32}{3}, \frac{64}{3}$   
 A) Not geometric                      B) 6                      C) 4                      D) 2                      2) \_\_\_\_\_

Determine whether the given sequence is arithmetic, geometric, or neither. If arithmetic, find the common difference. If geometric, find the common ratio.

3)  $\{4n-2\}$   
 A) Geometric,  $r = 4$                       B) Arithmetic,  $d = 4$   
 C) Arithmetic,  $d = -2$                       D) Neither                      3) \_\_\_\_\_

4)  $\{5n^2-4\}$   
 A) Arithmetic,  $d = 5$                       B) Neither  
 C) Geometric,  $r = 5$                       D) Arithmetic,  $d = -4$                       4) \_\_\_\_\_

5)  $\left\{ \left( \frac{6}{5} \right)^n \right\}$   
 A) Geometric,  $r = \frac{5}{6}$                       B) Neither  
 C) Arithmetic,  $d = \frac{6}{5}$                       D) Geometric,  $r = \frac{6}{5}$                       5) \_\_\_\_\_

Find the first four terms of the geometric sequence.

6)  $a = 18, r = \frac{1}{3}$   
 A) 18, 6, 2,  $\frac{2}{3}$                       B) 3, 54, 162, 486                      C) 18, 2,  $\frac{2}{3}, \frac{2}{9}$                       D) 18, 21, 24, 27                      6) \_\_\_\_\_

Find the indicated term for the geometric sequence.

7) 4, -12, 36, ...; Find  $a_{11}$ .  
 A) 2,125,764                      B) -708,588                      C) 59,049                      D) 236,196                      7) \_\_\_\_\_

Find the general term for the geometric sequence.  $\rightarrow$  find  $a_n$

8)  $\frac{1}{3}, \frac{1}{12}, \dots$   
 A)  $a_n = \frac{1}{9n-6}$                       B)  $a_n = \frac{1}{3+9n-1}$                       C)  $a_n = \frac{1}{3} \left( \frac{1}{4} \right)^{n-1}$                       D)  $a_n = \frac{1}{3} \left( \frac{1}{4} \right)^{1-n}$                       8) \_\_\_\_\_

Find the  $n^{\text{th}}$  term of the geometric sequence.

9)  $a = -3; r = \left( -\frac{1}{2} \right)$   
 A)  $a_n = -3 \left( -\frac{1}{2} \right)^{n-1}$                       B)  $a_n = -\frac{1}{2} (-3)^{n-1}$                       C)  $a_n = -3 \left( -\frac{1}{2} \right)^n$                       D)  $a_n = -3 \left( \frac{1}{2} \right)^{n-1}$                       9) \_\_\_\_\_

10)  $4, 2, 1, \frac{1}{2}, \dots$

A)  $a_n = 4 \left(\frac{1}{4}\right)^{n-1}$

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

C)  $a_n = 4 \cdot 2^{n-1}$

D)  $a_n = 4 \left(\frac{1}{2}\right)^{n-1}$

10) \_\_\_\_\_

Use the formula for  $S_n$  to find the sum for the geometric sequence.

11) 1, 4, 16, 64, 256

A) 341

B) 337

C) 331

D) 340

11) \_\_\_\_\_

12)  $\sum_{i=1}^5 2(4)^i$

A) 264

B) 40

C) 2728

D) 5140

12) \_\_\_\_\_

Find the sum, if it exists, for the infinite geometric sequence.

13)  $\sum_{i=1}^{\infty} 5(2)^i$

A) 10.000

B) -2.500

C) Does not exist

D) 110.000

13) \_\_\_\_\_

14)  $\sum_{i=1}^{\infty} 2 \left(\frac{1}{5}\right)^i$

A) 0.4

B) 0.5

C) 1

D) Does not exist

14) \_\_\_\_\_

### Answer Key

Testname: 150\_1.3\_REV\_SP03.TST

- 1) Answer: B
- 2) Answer: D
- 3) Answer: B
- 4) Answer: B
- 5) Answer: D
- 6) Answer: A
- 7) Answer: D
- 8) Answer: C
- 9) Answer: A
- 10) Answer: D
- 11) Answer: A
- 12) Answer: C
- 13) Answer: C
- 14) Answer: B

# Key 7.3 Review

(K1)

Find Common Ratio:  $r = \frac{a_{k+1}}{a_k}$

①  $\frac{16}{4} = r = 4$  (B)

②  $\frac{\frac{8}{3}}{\frac{4}{3}} = \frac{8}{4} = 2$  (D)

Determine whether the sequence is geometric arithmetic or neither.

③  $4n-2$  ;  $\underbrace{2, 6, 10}_{+4 \quad +4}$  (B)  
arithmetic

④  $5n^2-4$  ;  $\underbrace{1, 16, 41}_{+15 \quad +25}$  not arith.  
 $\frac{16}{1} = 16$   
 $\frac{41}{16} \neq 16$  so not geometric  
so neither (B)

⑤  $(\frac{6}{5})^n$  ;  $\frac{6}{5}, \frac{36}{25}, \frac{216}{125}$   
not arithmetic

$\frac{\frac{36}{25}}{\frac{6}{5}} = \frac{6}{5}$      $\frac{\frac{216}{125}}{\frac{36}{25}} = \frac{6}{5}$  so geometric (D)  
 $r = \frac{6}{5}$

⑥ First 4 terms  $a_1 = 18$   $r = \frac{1}{3}$  (A)  
 $a_n = a_1 r^{n-1}$   
 $a_n = 18(\frac{1}{3})^{n-1}$      $18, 6, 2, \frac{2}{3}$   
 $a_3 = 18(\frac{1}{3})^2 = 18(\frac{1}{9}) = 2$   
 $a_4 = 18(\frac{1}{3})^3 = 18(\frac{1}{27}) = \frac{2}{3}$

⑦ 4, -12, 36 find  $a_1$

$$a_n = a_1 r^{n-1}$$
$$= 4(-3)^{10} = 236,196$$

(D)

(K2)

$$\frac{-12}{4} = -3 = r$$

⑧ find the general term:

$\frac{1}{3}, \frac{1}{12}, \dots$

$$a_1 = \frac{1}{3}$$

$$r = \frac{\frac{1}{12}}{\frac{1}{3}} = \frac{1}{4}$$

$$a_n = a_1 r^{n-1}$$
$$= \frac{1}{3} \left(\frac{1}{4}\right)^{n-1}$$

(C)

⑨  $a_1 = -3$   $r = -\frac{1}{2}$

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

(A)

⑩ 4, 2, 1,  $\frac{1}{2}, \dots$

$$a_1 = 4 \quad r = \frac{2}{4} = \frac{1}{2}$$

$$a_n = 4 \left(\frac{1}{2}\right)^{n-1}$$

(D)

⑪ 1, 4, 16, 64, 256  
1 2 3 4 5  $\Rightarrow n=5$

$$S_n = \frac{a_1(1-r^n)}{1-r}$$

$$a_1 = 1$$
$$r = \frac{4}{1} = 4$$

$$S_5 = \frac{1(1-4^5)}{1-4} = \frac{-1023}{-3} = 341$$

(A)

⑫  $n=5$   
 $r=4$   
 $a_1 = 2(4)^1 = 8$

$$S_5 = \frac{8(1-4^5)}{1-4}$$
$$= \frac{-8184}{-3} = 2728$$

(C)

$$(13) \sum_{i=1}^{\infty} 5(2)^i$$

$$a_1 = 5(2)^1 = 10$$

$r = 2 > 1$  so  $S_{\infty}$  does not exist

$$S_{\infty} = \frac{a_1}{1-r} ; |r| < 1 \quad (K3)$$

(C)

$$(14) \sum_{i=1}^{\infty} 2\left(\frac{1}{5}\right)^i$$

$$a_1 = 2\left(\frac{1}{5}\right)^1 = \frac{2}{5}$$

$$r = \frac{1}{5} < 1$$

so

$$S_{\infty} = \frac{\frac{2}{5}}{1 - \frac{1}{5}}$$

$$= \frac{\frac{2}{5}}{\frac{4}{5}} = \frac{1}{2}$$

(B)