Sequence Notes: Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

🡪 A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is an ordered list of numbers. (Example: $2, 4, 6, 8, 10, …$)

🡪 Each number in a sequence is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_. (In the above sequence, 8 is the 4th term.)

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| **Arithmetic Sequence**🡪 In an arithmetic sequence, each term is found by \_\_\_\_\_\_\_\_\_\_\_\_\_\_ the same number to the previous term. This number being added each time is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | **Geometric Sequence**🡪 In a geometric sequence, each term is found by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ a nonzero constant by the previous number. This number you are multiplying with each time is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. |

\*\*\*You are never subtracting, just adding a negative number\*\*\*

\*\*\*You are never dividing, just multiplying by a fraction\*\*\*

Determine whether each sequence is arithmetic or geometric. Then state the common difference or common ratio and find the next two terms in the sequence.

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| 1) $8, 13, 18, 23, …$ | 2) $1, 3, 9, 27, …$ |
| 3) $4, 7, 10, 13, …$ | 4) $-4, 8, -16, 32, …$ |
| 5) $20, 17, 14, 11, …$ | 6) $160, 80, 40, 20, …$ |
| 7) $1, -3, 9, -27, …$ | 8) $0.3, 0.6, 0.9, 1.2, … $ |
| 9) $64, -32, 16, -8, …$ | 10) $-10, -7, -4, -1, …$ |

**🡪 We can also write a variable expression to express the relationship between 2 consecutive terms in a sequence.**

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| Example 1) $3, 6, 9, 12, …$What is the common difference: \_\_\_\_\_\_\_\_\_If \_\_\_\_\_\_ represents a number in the sequence the next term in the sequence can be determined using the variable expression:\_\_\_\_\_\_\_\_\_\_\_\_\_\_Check: | Example 2) $1, 5, 25, 125, …$What is the common ratio: \_\_\_\_\_\_\_\_\_If \_\_\_\_\_\_\_ represents a number in the sequence the next term in the sequence can be determined using the variable expression:\_\_\_\_\_\_\_\_\_\_\_\_\_\_Check: |

Sequence Notes: Name: Answer Key

🡪 A sequence is an ordered list of numbers. (Example: $2, 4, 6, 8, 10, …$)

🡪 Each number in a sequence is called a term. (In the above sequence, 8 is the 4th term.)

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| **Arithmetic Sequence**🡪 In an arithmetic sequence, each term is found by adding the same number to the previous term. This number being added each time is called the common difference. | **Geometric Sequence**🡪 In a geometric sequence, each term is found by multiplying a nonzero constant by the previous number. This number you are multiplying with each time is called the common ratio. |

\*\*\*You are never subtracting, just adding a negative number\*\*\*

\*\*\*You are never dividing, just multiplying by a fraction\*\*\*

Determine whether each sequence is arithmetic or geometric. Then state the common difference or common ratio and find the next two terms in the sequence.

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| 1) $8, 13, 18, 23, …$$23-18=5$ Arithmetic$18-13=5$ Common Difference $+5$$13-8=5$ $28, 33$ | 2) $1, 3, 9, 27, …$$$27-9=18$$$9-3=6$ can’t be arithmetic$\frac{27}{9}=3$ Geometric $\frac{9}{3}=3$ Common Ratio $\*3$$\frac{3}{1}=3$ 81, 243 |
| 3) $4, 7, 10, 13, …$$13-10=3$ Arithmetic$10-7=3$ Common Difference $+3$$7-4=3$ $16, 19$ | 4) $-4, 8, -16, 32, …$$$32-(-16)=48$$$-16-8=-24$ can’t be arithmetic$\frac{32}{-16}=-2$ Geometric $\frac{-16}{8}=-2$ Common Ratio $\*(-2)$$\frac{8}{-4}=-2$ $-64, 128$ |
| 5) $20, 17, 14, 11, …$$11-14=-3$ Arithmetic$14-17=-3$ Common Difference $+(-3)$$17-20=-3$ $8, 5$ | 6) $160, 80, 40, 20, …$$$20-40=-20$$$40-80=-40$ can’t be arithmetic$\frac{20}{40}=0.5$ Geometric $\frac{40}{80}=0.5$ Common Ratio $\*\frac{1}{2}$$\frac{80}{160}=0.5$ 10, 5 |
| 7) $1, -3, 9, -27, …$$$-27-9=-36$$$9-\left(-3\right)=12$ can’t be arithmetic$\frac{-27}{9}=-3$ Geometric $\frac{9}{-3}=-3$ Common Ratio $\*(-3)$$\frac{-3}{1}=-3$ $-81, 243$ | 8) $0.3, 0.6, 0.9, 1.2, … $$1.2-0.9=0.3$ Arithmetic$0.9-0.6=0.3$ Common Difference $+(0.3)$$0.6-0.3=0.3$ $1.5, 1.8$ |
| 9) $64, -32, 16, -8, …$$$-8-16=-24$$$16-\left(-32\right)=48$ can’t be arithmetic$\frac{-8}{16}=-0.5$ Geometric $\frac{16}{-32}=-2$ Common Ratio $\*(-\frac{1}{2})$$\frac{-32}{64}=-2$ $4, -2$ | 10) $-10, -7, -4, -1, …$$-1-(-4)=3$ Arithmetic$-4-(-7)=3$ Common Difference $+3$$-7-(-10)=3$ $2, 5$ |

**🡪 We can also write a variable expression to express the relationship between 2 consecutive terms in a sequence.**

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| Example 1) $3, 6, 9, 12, …$What is the common difference: $+3$If n represents a number in the sequence the next term in the sequence can be determined using the variable expression:$$n+3$$Check: | Example 2) $1, 5, 25, 125, …$What is the common ratio: $\*5$If n represents a number in the sequence the next term in the sequence can be determined using the variable expression:$$5n$$Check: |