**Geometric Sequences & Series**

**Unit Test**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Multiple Choice**

*Identify the choice that best completes the statement or answers the question.*

**\_\_\_\_ 1.** Which sequence could be geometric?

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** | –4, –9, –27, –81, ... | **C.** | –4, –8, –16, –324, ... |
| **B.** | –4, –12, –36, –108, ... | **D.** | –4, –6, –18, –54, ... |

**\_\_\_\_ 2.** In a geometric sequence,  and . Determine *t*1.

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 3.** In a finite geometric sequence,  and . Determine *t*10.

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 4.** A new car worth $24 800 depreciates in value by about 24% each year. Estimate the value of the car at the end of 8 years.

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** | $18 848.00 | **C.** | $1594.36 |
| **B.** | $6288.10 | **D.** | $3632.01 |

**\_\_\_\_ 5.** Determine the 7th term of this geometric sequence: 10, –40, 160, –640, ...

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 6.** Determine the sum of the first 6 terms of this geometric series:  ...

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 7.** The sum of the first 5 terms of a geometric series is 682. The common ratio is . Determine the 3rd term.

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 8.** Determine whether this infinite geometric series has a finite sum: 

If it does, determine the sum.

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** | This series does not have a finite sum. |

**\_\_\_\_ 9.** Use an infinite geometric series to express  as a fraction.

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**Short Answer**

1. Find the following sum:

$$\sum\_{x=3}^{8}4(3)^{1-x}$$

1. A ball is dropped from a height of 10 m. After each bounce, the ball rises to 80% of its previous height. What is total vertical distance that the ball travels before it comes to rest?
2. If a person received a 10% salary increase each year for 5 years, and earned a total of $155 680.05, determine the starting salary.
3. If 200 g of substance decays to 17 g in 28 days, determine the half-life of this substance. Answer accurate to one decimal place.

**Bonus Question**

As I was going to St. Ives

I met a man with 7 wives

Every wife had 7 sacks

Every sack had 7 cats

Every cat had 7 kits

Kits, cats, sacks, and wives,

How many were going to St. Ives?

**Seqser**

**Answer Section**

**MULTIPLE CHOICE**

 **1.** ANS: B PTS: 1 DIF: Easy REF: 1.3 Geometric Sequences

LOC: 11.RF10 TOP: Relations and Functions KEY: Procedural Knowledge

 **2.** ANS: C PTS: 1 DIF: Moderate REF: 1.3 Geometric Sequences

LOC: 11.RF10 TOP: Relations and Functions

KEY: Conceptual Understanding | Procedural Knowledge

 **3.** ANS: D PTS: 1 DIF: Moderate REF: 1.3 Geometric Sequences

LOC: 11.RF10 TOP: Relations and Functions

KEY: Conceptual Understanding | Procedural Knowledge

 **4.** ANS: D PTS: 1 DIF: Moderate REF: 1.3 Geometric Sequences

LOC: 11.RF10 TOP: Relations and Functions

KEY: Problem-Solving Skills | Procedural Knowledge

 **5.** ANS: B PTS: 1 DIF: Easy REF: 1.3 Geometric Sequences

LOC: 11.RF10 TOP: Relations and Functions KEY: Procedural Knowledge

 **6.** ANS: D PTS: 1 DIF: Easy REF: 1.4 Geometric Series

LOC: 11.RF10 TOP: Relations and Functions KEY: Procedural Knowledge

 **7.** ANS: B PTS: 1 DIF: Moderate REF: 1.4 Geometric Series

LOC: 11.RF10 TOP: Relations and Functions KEY: Procedural Knowledge

 **8.** ANS: B PTS: 1 DIF: Easy REF: 1.6 Infinite Geometric Series

LOC: 11.RF10 TOP: Relations and Functions

KEY: Conceptual Understanding | Procedural Knowledge

 **9.** ANS: C PTS: 1 DIF: Moderate REF: 1.6 Infinite Geometric Series

LOC: 11.RF10 TOP: Relations and Functions KEY: Procedural Knowledge