Unit 7 Test Review Name: Key

Determine the type of sequence: arithmetic or geometric? Then find the common ratio or common difference of the sequence.

1. 1, 8, 15, 22, ...

+7 +7 +7

Arith

2. 1, 2, 4, 8, ...

×2 ×2

Geo

3. 4, 14, 24, 34, ...

+10 +10

Arith

4. 2700, 900, 300, 100, ...

$\times\frac{1}{3}$ $\times\frac{1}{3}$

Geo

5. Find the total amount of money earned in 8 days if daily wages follow the sequence 1, 3, 9, 27, ... dollars.

×3 ×3

Geo $a_1 = 1$, $r = 3$, $n = 8$

$S_8 = \frac{1(1-3^8)}{(1-3)}$

$= 3280$

6. Find the total cost of the electricity bill after 9 days if it follows the sequence 1, 6, 36, 216, ...

×6 ×6

Geo $a_1 = 1$, $r = 6$, $n = 9$

$S_9 = \frac{1(1-6^9)}{(1-6)}$

$= 2015,539$

7. How much money will be earned on day 12 if daily wages follow the sequence 1, 3, 9, 27, ... dollars.

×3

Geo

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

$a_{12} = 1(3)^{12-1} = 3^{11} = 177,147$

8. How many calories will be lost on day 15 if calorie loss follows the sequence 1, 5, 25, 125, ...

×5

Geo

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

$a_{15} = 1(5)^{15-1} = 5^{14}$

$= 6103,515,625$

9. Evaluate the arithmetic series:

$$\sum_{i=1}^{25}(3n-1) = 950$$

10. Evaluate the arithmetic series:

$$\sum_{i=1}^{20}(n+2) = 250$$

11. Evaluate the sum of the geometric series:

$$\sum_{i=1}^{7}(2\cdot 2^n) = \boxed{508}$$

12. Evaluate the sum of the geometric series:

$$\sum_{i=1}^{5}(2\cdot 4^n) = \boxed{2728}$$

For 13-15, use the arithmetic sequence 3, 8, 13, 18, ... (+5)

13. Determine a_n

$a_n = a_1 + d(n-1)$

$a_n = 3 + 5(n-1)$

$= 3 + 5n - 5$

$\boxed{a_n = 5n - 2}$

14. Find the 15th term

$a_{15} = 5(15) - 2$

$= \boxed{73}$

15. Evaluate S_{15}

$S_{15} = \frac{n}{2}[2a_1 + d(n-1)]$

$= \frac{15}{2}[2(3) + 5(15-1)]$

$= \frac{15}{2}[6 + 5(14)]$

$= \frac{15}{2}(76)$

$= \boxed{570}$

For 16-18, use the geometric sequence 2, 8, 32, 128, ... (×4)

16. Determine a_n

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

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

17. Find the 10th term

$a_{10} = 2(4^{10-1})$

$= 2 \cdot 4^9$

$= \boxed{524,288}$

18. Evaluate S_{10}

$S_{10} = \frac{a_1(1-r^n)}{(1-r)}$

$= \frac{2(1-4^{10})}{(1-4)}$

$= \boxed{699,050}$

For 19-22, find the first 5 terms of the sequence.

19. $a_n = 7n + 7$ $\boxed{14, 21, 28, 35, 42}$

n	7n+7
1	7+7 = 14
2	14+7 = 21
3	21+7 = 28
4	28+7 = 35
5	35+7 = 42

20. $a_n = 2 \cdot \frac{1}{2}^{n-1}$ $\boxed{2, 1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}}$

n	
1	$2 \cdot \frac{1}{2}^0 = 2$
2	$2 \cdot \frac{1}{2} = 1$
3	$2 \cdot \frac{1}{4} = \frac{1}{2}$
4	$\frac{1}{4}$
5	$\frac{1}{8}$

21. $a_n = 5n - 3$

n	
1	$5-3 = 2$
2	$10-3 = 7$
3	$15-3 = 12$
4	$20-3 = 17$
5	22

2, 7, 12, 17, 22

22. $a_n = 2 \cdot 3^{n-1}$

n	
1	$2 \cdot 3^0 = 2$
2	$2 \cdot 3^1 = 6$
3	$2 \cdot 3^2 = 18$
4	$2 \cdot 3^3 = 54$
5	$2 \cdot 3^4 = 2 \cdot 81 = 162$

2, 6, 18, 54, 162

For 23-25, use the arithmetic sequence 2, 10, 18, 26, ... (+8)

23. Determine a_n

$a_1 = 2$

$d = 8$

$a_n = 2 + 8(n-1)$

$= 2 + 8n - 8$

$a_n = 8n - 6$

24. Find the 13th term

$a_{13} = 8(13) - 6$

$= 98$

25. Evaluate S_{13}

$S_{13} = \frac{n}{2}[2a_1 + d(n-1)]$

$= \frac{13}{2}[2(2) + 8(13-1)]$

$= \frac{13}{2}[4 + 8(12)]$

$= 650$

For 26-28, use the geometric sequence 3, 12, 48, 192 ... (×4)

26. Determine a_n

$a_1 = 3$

$r = 4$

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

$a_n = 3(4)^{n-1}$

27. Find the 7th term

$a_7 = 3(4^{7-1})$

$= 3(4^6)$

$= 12,288$

28. Evaluate S_7

$S_7 = \frac{a_1(1-r^n)}{(1-r)}$

$= \frac{3(1-4^7)}{(1-4)}$

$= 16,383$