

Chapter 7 Review WKST

I. Know your formulas.

<ul style="list-style-type: none"> ○ Arithmetic Sequences/Series ▪ $a_n =$ _____ ▪ $S_n =$ _____ 	<ul style="list-style-type: none"> ○ Geometric Sequences/Series ▪ $a_n =$ _____ ▪ $S_n =$ _____ ▪ $S =$ _____
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II. Determine whether the sequence is arithmetic, geometric, or neither. Then write an explicit and recursive rule.

1. 2, -3, -8, -13...	2. 4, 6, 9, $\frac{27}{2}$...	3. 10, 7, 4, 1, -2...
4. 4, -2, 1, $\frac{-1}{2}$...	5. 0.7, 0.07, 0.007, ...	

III. Use sigma notation to represent each series below. Then find the sum, if possible.

6. $3 + 5 + 7 + 9 + 11 + 13 + \dots$	7. $2 + \frac{2}{9} + \frac{2}{81} + \dots$	8. $9 - 18 + 36 - 72 \dots$
9. $3 + 7 + 11 + 15 + 19$	10. $5 + 10 + 20 + \dots + 20480$	11. $1 - \frac{\sqrt{2}}{2} + \frac{1}{2} + \dots$

IV. Find the indicated term.

12. Arithmetic sequence: $a_8 = 25$ and $a_{20} = 61$, find a_{30} .	13. Geometric sequence: $a_3 = 12$ and $a_6 = 96$, find a_{11} .	14. Arithmetic sequence: $a_6 = 6x + 1$ and $a_9 = 12x^2 - 23$, find a_3 .
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V. Find the sum.

15. Find the sum of the first 12 positive 3 digit integers ending in 4.	16. Find the sum of the first 203 positive odd integers.	17. $\sum_{n=2}^6 n^2$
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VI. Generate the first 5 terms of the recursively-defined sequence.

18. $a_n = 3a_{n-1}$ if $a_1 = 4$	19. $a_n = a_{n-1} + (a_{n-2})^2 - 5$ if $a_1 = 3$ and $a_2 = 2$
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VII. Find the missing terms.

20. Arithmetic: ...36, _____, 96...	21. Geometric: ...36, _____, 96...
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22. Given the explicit formula $a_n = 5n - 44$, write the recursive formula.

23. How many terms of the arithmetic sequence $-3, 2, 7, \dots$ must be added together for the sum of the series to be 116?

24. Ben started a job that paid \$40,000 a year. Each year after the first, his salary was increased by 4%. What was Ben's salary in his 8th year of employment? What is the total amount that Ben earned in eight years? Round to the nearest cent.

Answers

1. Arithmetic; Explicit: $a_n = 7 - 5n$; Recursive: $a_1 = 2$ $a_n = a_{n-1} - 5$
2. Geometric; Explicit: $a_n = (4)\left(\frac{3}{2}\right)^{n-1}$; Recursive: $a_1 = 4$ $a_n = \frac{3}{2}a_{n-1}$
3. Arithmetic; Explicit: $a_n = 13 - 3n$; Recursive: $a_1 = 10$ $a_n = a_{n-1} - 3$
4. Geometric; Explicit: $a_n = (4)\left(-\frac{1}{2}\right)^{n-1}$; Recursive $a_1 = 4$ $a_n = -\frac{1}{2}a_{n-1}$
5. Geometric; Explicit: $a_n = (0.7)(0.1)^{n-1}$; Recursive $a_1 = 0.7$ $a_n = 0.1a_{n-1}$
- 6.

a. $\sum_{n=1}^{\infty} 2n+1$

b. No sum exists because the arithmetic series diverges.

7.

a. $\sum_{n=1}^{\infty} (2)\left(\frac{1}{9}\right)^{n-1}$

b. $\frac{9}{4}$

8.

a. $\sum_{n=1}^{\infty} (9)(-2)^{n-1}$

b. No sum exists because $|r| = |-2| \geq 1$ and the geometric series diverges.

9.

a. $\sum_{n=1}^5 4n - 1$

b. 55

10.

a. $\sum_{n=1}^{13} 5(2)^{n-1}$

b. 40955

11.

a. $\sum_{n=1}^{\infty} \left(-\frac{\sqrt{2}}{2}\right)^{n-1}$

b. $2 - \sqrt{2}$

12. 91

13. 3072

14. $-12x^2 + 12x + 25$

15. 1908

16. 41,209

17. 90

18. $a_1 = 4, a_2 = 12, a_3 = 36, a_4 = 108, a_5 = 324$

19. $a_1 = 3, a_2 = 2, a_3 = 6, a_4 = 5, a_5 = 36$

20. 66

21. $24\sqrt{6}$ or $-24\sqrt{6}$

22. $a_1 = -39$ $a_n = a_{n-1} + 5$

23. 8

24. Ben's salary in his 8th year: \$52,637.27; Total amount in 8 years: \$368,569.05