

KEY

AFM Unit 4 Test - Review

1. Consider the sequence $1, \frac{2}{5}, \frac{4}{25}, \frac{8}{125}, \dots$
- Describe the pattern formed in the sequence. *multiply by $\frac{2}{5}$*
 - Find the next three terms. *$\frac{16}{625}, \frac{32}{3125}, \frac{64}{15625}$*
2. i.) Write a formula for the arithmetic sequence $6, 0, -6, -12, -18, \dots$
- ii.) Then find the next term. *-24* $a_n = 6 + -6(n-1)$

Describe the pattern in the sequence. Find the next three terms.

3. $800, 320, 128, 51.2, \dots$ *multiply by $\frac{2}{5}$* $20.48, 8.19, 3.28$

4. Evaluate the series $\sum_{n=4}^6 5n$. *75*

5. Find a formula for the sequence. $1, 5, 9, 13, \dots$ $a_n = 1 + 4(n-1)$

6. Use summation notation to write the series $3 + 5 + 7 + 9 + \dots$ for 9 terms. $\sum_{n=1}^9 3 + 2(n-1)$

Evaluate the infinite geometric series. Round to the nearest hundredth if necessary.

7. $1 + 0.5 + 0.25 + \dots$ *2*

8. Find the 30th term of the sequence $5, -1, -7, -13, \dots$ *-169*

9. Consider the sequence $16, -8, 4, -2, 1, \dots$

a. Describe the pattern formed in the sequence. *multiply by $\frac{1}{2}$*

b. Find the next three terms. *$-\frac{1}{2}, \frac{1}{4}, -\frac{1}{8}$*

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

$$a_{30} = 5 + (30-1)(-6)$$

10. Given the formula $a_n = -3(a_{n-1} - 1)$, find the first five terms of the sequence starting with 5.

11. What is the next term: $2, -6, 18, -54, \dots$ *162*

$$5, -12, 39, -114, 345$$

12. The sequence $15, 21, 27, 33, 39, \dots, 75$ has 11 terms. Evaluate the related series. *495*

13. Consider the infinite geometric series $\sum_{n=1}^{\infty} -4\left(\frac{1}{3}\right)^{n-1}$. *$-4, -\frac{4}{3}, -\frac{4}{9}, -\frac{4}{27}$*

a. Write the first four terms of the series.

b. Does the series *diverge* or *converge*?

c. If the series has a sum, find the sum. *-6*

$$-2-3-4-5$$

14. Consider the sequence $8, 6, 3, -1, -6, \dots$

a. Find the next two terms of the sequence. *-12, -19*

b. Write an explicit formula for the sequence.

c. Write a recursive formula for the sequence.

$$a_n = a_{n-1} - n$$

KEY

15. Describe the pattern with a geometric sequence formula. Then find the next two numbers in the pattern. 1, .5, .25, .125, ...

$$a_n = 1(.5)^{n-1} \quad .0625, .03125$$

16. Describe the pattern in the sequence. Find the next three terms. 13, 15, 17, 19, ...

add 2 21, 23, 25

Does the infinite geometric series diverge or converge? Explain.

★ $|r| < 1$ con
 $r > 1$ div

17. $2 + 10 + 50 + 250 + \dots$

D

18. $\frac{1}{5} + \frac{1}{10} + \frac{1}{20} + \frac{1}{40} + \dots$

a. It diverges; it has a sum.

b. It diverges; it does not have a sum.

c. It converges; it has a sum.

d. It converges; it does not have a sum.

19. For the series $\sum_{n=4}^9 (n+1)$, find the number of terms in the series.

4 5 6 7 8 9

a. 4 terms

b. 13 terms

c. 6 terms

d. 5 terms

20. Consider the sequence $-7, -5.6, -4.2, -2.8, -1.4, \dots$

a. Write an explicit formula for the sequence. Explain your steps.

$$a_n = -7 + 1.4(n-1)$$

b. Write a recursive formula for the sequence. Explain your steps.

$$a_n = a_{n-1} + 1.4$$

c. Suppose you need to find the 50th term of the sequence. Explain which formula you would use.

explicit

d. Which term is the number 103.6? Explain your method for solving this problem.

80th

5
6
7
8
9
10

21.

21. Find the first four terms and the tenth term of the sequence whose n th term is defined by $a_n = n^2 - 1$

0, 3, 8, 15 99

22. Find the common difference, the fourth term, and the n th term in the arithmetic sequence 80, 76, 72, ...

$d=4$ $a_n = 80 - 4(n-1)$ $a_4 = 68$

(23) The first term of a geometric sequence is 25, and the fourth term is $\frac{1}{5}$. Find the common ratio, and the fifth term.

$a_1 = 25$ $r = \frac{1}{5}$ $a_5 = \frac{1}{25}$

24. The first term of an arithmetic sequence is 10, and the tenth term is 2. Find the sum of the first ten terms.

60 $a_1 = 10$
 $a_{10} = 2$

25. Find the common difference and the 100th term of the sequence in (a).

25 \times \times \times $\frac{1}{5}$ $\times \frac{1}{5}$

$$S_{10} = \frac{n}{2}(a_1 + a_n)$$

$$\frac{10}{2}(10 + 2)$$

$$5(12)$$

$$25 \times 3 = \frac{1}{5}$$

$$,008 = \times 3$$

$$\times = 2$$