Chapter 6 - Discrete Functions - Review

MCR3U

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Write the required formulas:

Arithmetic Term Formula:

Arithmetic Series Formula:

Geometric Term Formula:

Geometric Series Formula:

Section 1: Sequences

- 1) Determine whether each sequence is arithmetic, geometric, or neither.
- **a)** −1, 9, 19, 29, ...

b) 3, 12, 19, 44, ...

c) -2, 6, -18, 54, ...

- **2)** For each arithmetic sequence, write the first three terms, then calculate term 13.
- **a)** $t_n = 2n 10$

b) $t_n = 40 + 13n$

3) For each geometric sequence write the first four terms.

a)
$$t_n = 3(\sqrt{2}^{n-1})$$

b)
$$a = 800, r = -1/4$$

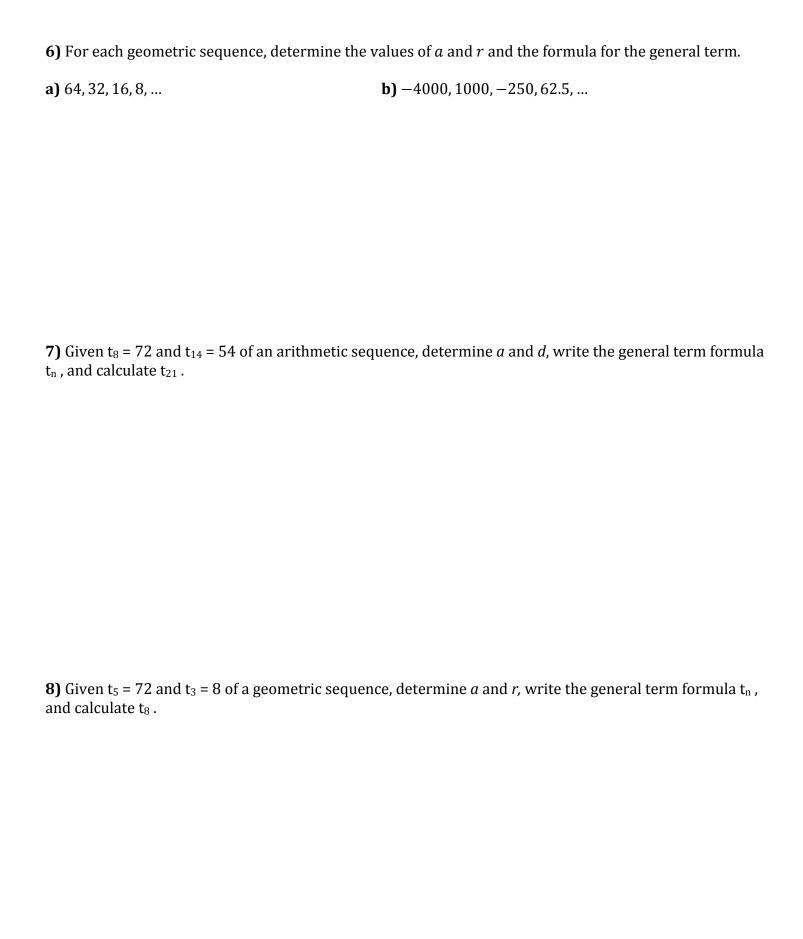
4) For each arithmetic sequence, determine the values of a and d and the formula for the general term. Then, write the next four terms.

b)
$$\frac{2}{3}$$
, $\frac{11}{12}$, $\frac{7}{6}$, $\frac{17}{12}$

5) Write the first three terms of each geometric sequence

a)
$$f(n) = 2(-1)^n$$

b)
$$t_n = -3(2)^{n+1}$$



91	Determine the number of terms in each sequence. Prove mathematically	J.
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Section 2: Series

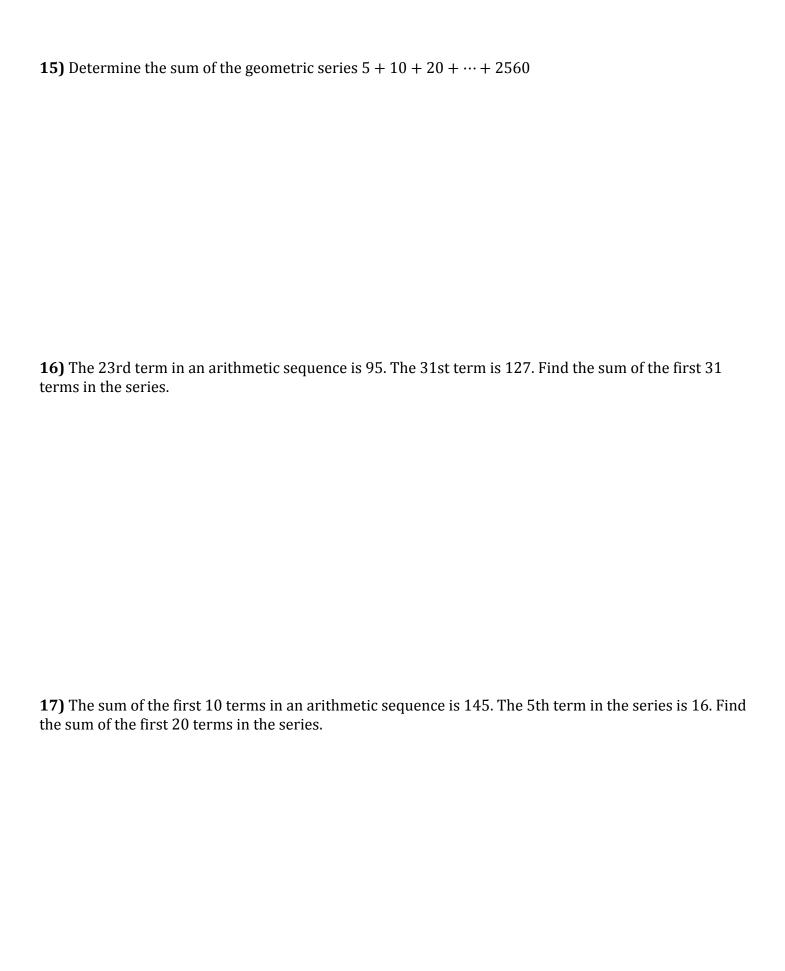
10) Find the sum of the first 28 terms of the arithmetic series that starts as: -6 - 1 + 4 + 9 + ...

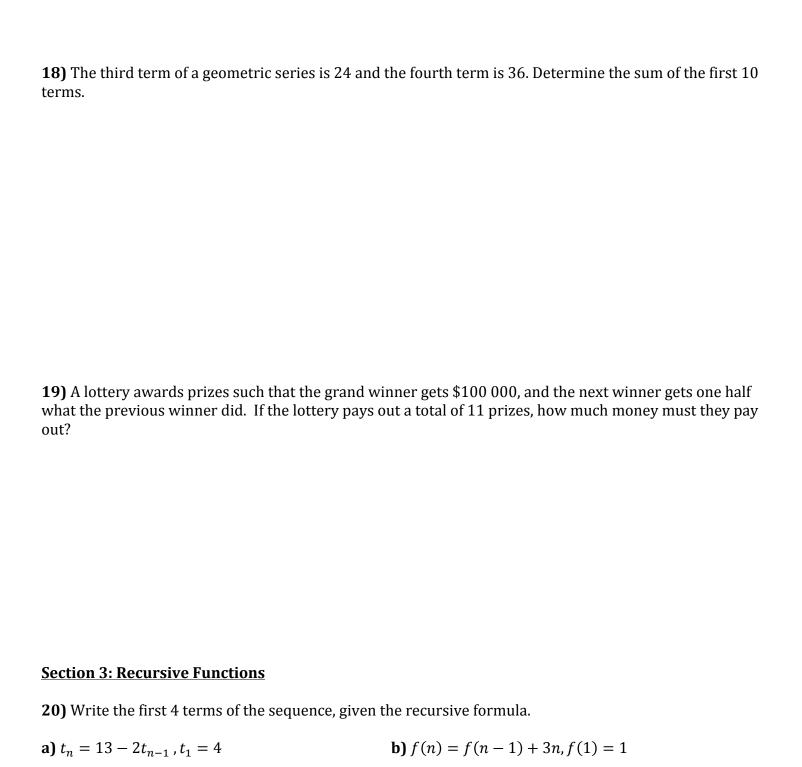
11) Find the sum of the first 11 terms of the series that begins with: $1024 + 512 + 256 + \dots$

12) Find S_{14} given $t_n = 5 + \frac{3}{2}n$

13) Find S₇ given $t_n = 5(2^{n-1})$.

14) What is the sum of the arithmetic series $2\sqrt{3} + 5\sqrt{3} + 8\sqrt{3} + \cdots + 83\sqrt{3}$





21) Determine a recursion formula for each sequence.

a) -2, 7, 16, 25, ...

b) 1, -3, 9, -27, ...

22) Expand the following using Pascal's Triangle.

a)
$$(3x + 5x^2)^4$$

b)
$$(2x^2 + y)^7$$

Answers

1) a) arithmetic b) neither c) geometric

2) a)
$$t_1 = -8$$
, $t_2 = -6$, $t_3 = -4$, $t_{13} = 16$ **b)** $t_1 = 53$, $t_2 = 66$, $t_3 = 79$, $t_{13} = 209$

3) a)
$$t_1 = 3$$
, $t_2 = 3\sqrt{2}$, $t_3 = 6$, $t_4 = 3\sqrt{8}$ **b)** $t_1 = 800$, $t_2 = -200$, $t_3 = 50$, $t_4 = -12.5$

- **4) a)** $t_n = 3 + (n-1)(-2)$; the next four terms are -5, -7, -9, -11 b) $t_n = \frac{2}{3} + (n-1)(\frac{1}{4})$; next four terms are $\frac{5}{3}, \frac{23}{12}, \frac{13}{6}, \frac{29}{12}$
- **5) a)** -2, 2, -2 **b)** -12, -24, -48

6) a)
$$t_n = 64 \left(\frac{1}{2}\right)^{n-1}$$
 b) $t_n = -4000 \left(-\frac{1}{4}\right)^{n-1}$

7)
$$t_n = 93 + (n-1)(-3)$$
; $t_{21} = 33$

8)
$$t_n = \frac{8}{9}(3)^{n-1}$$
; $t_8 = 1944$

- **9) a)** 20 terms **b)** 15 terms
- **10)** 1722
- **11)** 2047
- 12) $\frac{455}{2}$
- **13)** 635
- **14)** $1190\sqrt{3}$
- **15)** 5115
- **16)** 2077
- **17)** -10
- 18) $\frac{58025}{48}$
- **19)** 199 902.34
- **20) a)** 4, 5, 3, 7 **b)** 1, 7, 16, 28
- **21)** a) $t_1 = -2$, $t_n = t_{n-1} + 9$ b) $t_1 = 1$, $t_n = -3t_{n-1}$
- **22)** a) $81x^4 + 540x^5 + 1350x^6 + 1500x^7 + 625x^8$ b)
- **b)** $128x^{14} + 448x^{12}y + 672x^{10}y^2 + 560x^8y^3 + 280x^6y^4 + 84x^4y^5 + 14x^2y^6 + y^7$
- **23)** $375x^2y^6$