CHAPTER TEST

Achievement Chart

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1. Given the formula for the nth term, state the first 5 terms of each sequence. Then, graph \( t_n \) or \( f(n) \) versus \( n \).
   a) \( t_n = 2n - 3 \)  
   b) \( f(n) = n^2 + 3 \)

2. Given the formula for the nth term, find the twelfth term of each sequence.
   a) \( t_n = 4 + 3n \)  
   b) \( f(n) = (n + 1)^2 \)

3. Find the indicated terms.
   a) \( t_n = 6n - 1; t_8 \) and \( t_{24} \)  
   b) \( f(n) = 8 + 3n^2; t_6 \) and \( t_{20} \)

4. Given the formula for the nth term of each sequence, write the first 5 terms.
   a) \( t_n = 0.5n + 3 \)  
   b) \( f(n) = 5 - 3n \)  
   c) \( t_n = 6(2)^n - 1 \)  
   d) \( f(n) = 10(-2)^{n-1} \)

5. Find the formula for the nth term that determines each sequence. Then, find \( t_{21} \).
   a) 6, 10, 14, 18, ...  
   b) -5, -11, -17, -23, ...

6. Find the formula for the nth term that determines each sequence. Then, find \( t_8 \).
   a) 1, 4, 16, 64, ...  
   b) 10 000, -5000, 2500, -1250, ...

7. Find the indicated sum for each arithmetic series.
   a) \( S_{15} \) for \( 4 + 11 + 18 + ... \)  
   b) \( S_{20} \) for \( 99 + 88 + 77 + ... \)

8. Find the sum of the arithmetic series \(-12 - 9 - 6 - ... + 39\).

9. Find the indicated sum for each geometric series.
   a) \( S_9 \) for \( 7 + 14 + 28 + 56 + ... \)  
   b) \( S_6 \) for \( 2000 - 400 + 80 - ... \)

10. Find the sum of the geometric series \( 7 - 21 + 63 + ... - 1701 \).
11. **Space shuttle** When Dr. Roberta Bondar flew on the space shuttle, it lifted off at about 10:00 and then orbited Earth once every 90 min. At what time of day did it complete its 9th orbit?

12. **Bacterial culture** The number of bacteria in a culture is doubling every 30 min. If there are 10 000 bacteria at 16:00, how many will there be at 20:00 on the same day?

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13. **a)** If a number is added to each term of a geometric sequence, is the resulting sequence still geometric? Is it arithmetic? Explain.

**b)** If a number is multiplied by each term of an arithmetic sequence, is the resulting sequence still arithmetic? Is it geometric? Explain.

**c)** If an arithmetic sequence is added to a geometric sequence, term by term, is the resulting sequence arithmetic or geometric? Explain.

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**Answer questions 14 and 15 only if you studied section 6.4.**

14. **Write the first 4 terms determined by each recursion formula.**

   a) \( t_1 = 7; \ t_n = t_{n-1} - 3 \)

   b) \( t_1 = -2; \ t_n = t_{n-1} + n \)

   c) \( t_1 = 2000; \ t_n = -0.4t_{n-1} \)

   d) \( t_1 = 2; \ t_2 = 3; \ t_n = t_{n-1} - t_{n-2} \)

15. **Write an explicit formula for the sequence determined by each recursion formula.**

   a) \( t_1 = 2; \ t_n = 5t_{n-1} \)

   b) \( t_1 = -7; \ t_n = t_{n-1} + 8 \)