

**EXAMPLE 4**

on p. 804  
for Exs. 30–39

**WRITING RULES** Write a rule for the  $n$ th term of the arithmetic sequence that has the two given terms.

30.  $a_4 = 31, a_{10} = 85$       31.  $a_6 = 39, a_{14} = 79$       32.  $a_3 = -2, a_{17} = 40$   
 33.  $a_8 = -10, a_{20} = -58$       34.  $a_9 = 89, a_{15} = 137$       35.  $a_2 = 17, a_{11} = 35$   
 36.  $a_7 = 4, a_{12} = -9$       37.  $a_5 = 15, a_9 = 24$       38.  $a_6 = 0, a_{11} = -2$

39. **TAKS REASONING** For a certain arithmetic sequence,  $a_6 = -6$  and  $a_{13} = -48$ . What is a rule for the  $n$ th term of the sequence?

- (A)  $a_n = 18 + 6n$       (B)  $a_n = 30 - 6n$   
 (C)  $a_n = -6 + 24n$       (D)  $a_n = -36 - 6n$

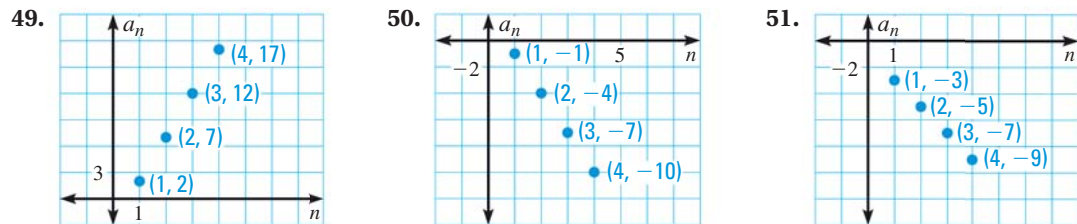
**EXAMPLE 5**

on p. 805  
for Exs. 40–48

**FINDING SUMS** Find the sum of the arithmetic series.

40.  $\sum_{i=1}^{10} (1 + 3i)$       41.  $\sum_{i=1}^8 (-3 - 2i)$       42.  $\sum_{i=1}^{18} (14 - 6i)$   
 43.  $\sum_{i=1}^{22} (-9 + 11i)$       44.  $\sum_{i=3}^9 (72 - 6i)$       45.  $\sum_{i=5}^{14} (-54 + 9i)$   
 46.  $2 + 6 + 10 + \cdots + 58$       47.  $-1 + 4 + 9 + \cdots + 34$       48.  $44 + 37 + 30 + \cdots + 2$

**USING GRAPHS** Write a rule for the sequence whose graph is shown.



52. **WRITING** Compare the graph of  $a_n = 3n + 2$ , where  $n$  is a positive integer, with the graph of  $f(x) = 3x + 2$ , where  $x$  is a real number. Discuss how the graph of an arithmetic sequence is similar to and different from the graph of a linear function.

**REASONING** Tell whether the statement is *true* or *false*. Explain your answer.

53. If the common difference of an arithmetic series is doubled while the first term and number of terms in the series remain unchanged, then the sum of the series is doubled.  
 54. If the numbers  $a$ ,  $b$ , and  $c$  are the first three terms of an arithmetic sequence, then  $b$  is half the sum of  $a$  and  $c$ .

**SOLVING EQUATIONS** Find the value of  $n$ .

55.  $\sum_{i=1}^n (-5 + 7i) = 486$       56.  $\sum_{i=1}^n (10 - 3i) = -28$       57.  $\sum_{i=1}^n (58 - 8i) = -1150$   
 58.  $\sum_{i=1}^n (5 - 5i) = -50$       59.  $\sum_{i=3}^n (-3 - 4i) = -507$       60.  $\sum_{i=5}^n (7 + 12i) = 455$

61. **REASONING** Find the sum of all positive odd integers less than 300.

62. **CHALLENGE** The numbers  $3 - x$ ,  $x$ , and  $1 - 3x$  are the first three terms in an arithmetic sequence. Find the value of  $x$  and the next term in the sequence.