

Arithmetic Series

Example:

$$3 + 9 + 15 + 21 + 27 + 33$$

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

Sum of
the first n terms

Example:

Find the sum: $\sum_{i=1}^{12} 2 + 7i$

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

$$S_{12} = \frac{12(9 + 86)}{2}$$

$$= 570$$

$$a_1 = 2 + 7(1) = 9$$

$$a_{12} = 2 + 7(12) = 86$$

Find S_{15} . $\overset{4}{\curvearrowright}$ 2, 6, 10, 14, ...

$$S_{15} = \frac{15(a_1 + a_{15})}{2}$$

$$= \frac{15(2 + 58)}{2}$$

$$= \boxed{450}$$

$$a_{15} = 2 + (15-1)d$$

$$= 2 + 14(4)$$

$$= 58$$

Find the sum: $44 + 37 + 30 + \dots + 2$

$$\frac{44}{-7} = 6$$

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

$$= \frac{n(44 + 2)}{2}$$

$$\frac{7(46)}{2}$$

$$161$$

$$44 - 7x = 2$$

$$2 = 44 + (n-1)(-7)$$

$$2 = 44 - 7n + 7$$

$$2 = 51 - 7n$$

$$-49 = -7n$$

$$n = 7$$

Pg 806 8, 14, 19, 20, 26, 32, 37,
40, 42, 46, 47, 55, 58 and
find S_{28} of 5, 13, 21, 29,...

A#62

IDENTIFYING ARITHMETIC SEQUENCES Tell whether the sequence is arithmetic.
Explain why or why not.

8. 20, 10, 5, 2.5, 1.25, ...

WRITING RULES Write a rule for the n th term of the arithmetic sequence. Then
find a_{20} .

14. 8, 21, 34, 47, 60, ... 19. $2, \frac{5}{3}, \frac{4}{3}, 1, \frac{2}{3}, \dots$ 20. 1.5, 3.6, 5.7, 7.8, 9.9, ...

WRITING RULES Write a rule for the n th term of the arithmetic sequence. Then
graph the first six terms of the sequence.

26. $a_{12} = -3, d = -7$

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

32. $a_3 = -2, a_{17} = 40$

37. $a_5 = 15, a_9 = 24$

FINDING SUMS Find the sum of the arithmetic series.

40. $\sum_{i=1}^{10} (1 + 3i)$ 42. $\sum_{i=1}^{18} (14 - 6i)$

46. $2 + 6 + 10 + \dots + 58$

47. $-1 + 4 + 9 + \dots + 34$

SOLVING EQUATIONS Find the value of n .

55. $\sum_{i=1}^n (-5 + 7i) = 486$

58. $\sum_{i=1}^n (5 - 5i) = -50$