

9-2

Practice

Form K

Arithmetic Sequences

Determine whether each sequence is arithmetic. If so, identify the common difference.

1. $1, 4, 7, 10, \dots$

$4 - 1 = 3$

$7 - 4 = 3$

$10 - 7 = 3$

This sequence is arithmetic.

The common difference is .

2. $6, 10, 14, 18, 22, \dots$

3. $1, 3, 6, 10, 15, \dots$

4. $-16, -13, -9, -4, 2, \dots$

5. $2, 9, 16, 23, 30, \dots$

6. $43, 56, 69, 82, \dots$

7. **Reasoning** Is the sequence represented by the formula $a_n = 4n + 8$ arithmetic? Explain.

Find the 24th term of each arithmetic sequence.

8. $4, 6, 8, 10, 12, \dots$

9. $2, 5, 8, 11, 14, \dots$

10. $9, 5, 1, -3, -7, \dots$

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

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

$a_{24} = 4 + (24 - 1)2$

$a_{24} = 4 + 46$

$a_{24} = \text{}$

Find the missing terms in the following arithmetic sequences.

11. $2, \text{, , } 14, \dots$

12. $3, \text{, , } 21, \dots$

13. $65, \text{, , } 32, \dots$

$14 = 2 + 3d$

$12 = 3d$

$d = 4$

$2 + 4 = \text{}$

$6 + 4 = \text{}$

14. **Error Analysis** Noah used the formula $a_n = a + (n - 1)d$ to find the 12th term in the sequence $2, 4, 7, 11, 16, \dots$. Did Noah find the correct term? How do you know?

9-2

Practice (continued)

Form K

Arithmetic Sequences

Find the missing term of each arithmetic sequence.

15. ... 4, , 18, ...

16. ... 9, , 37, ...

Find the arithmetic mean of the given terms.

$$4 + 18 = 22$$

$$22 \div 2 = 11$$

The missing term is .

17. 46, , 28, ...

18. -12, , -4, ...

19. ... 4, , -44, ...

20. **Error Analysis** Your friend used the arithmetic mean to find the missing term in the following sequence: 3, , 29, 42, ... His answer was 13. What error did your friend make? What is the correct answer?

21. An architect is designing a building with sides in the shape of a trapezoid. The number of windows on each floor forms an arithmetic sequence. There are 124 windows on the first floor and 116 windows on the second floor.

- Write an explicit formula to represent the sequence.
- How many windows are on the tenth floor?

22. Your cousin opened a bank account with a deposit of \$256 dollars. After one week, she had \$280 in her account. After two weeks, she had \$304, and after three weeks she had \$328. If this pattern continues, how much money will your cousin have in her account after 18 weeks?

23. There is a puddle 1.4 cm deep in your backyard. After one minute of rain, the puddle was 1.45 cm deep. The puddle was 1.5 cm deep after it rained for two minutes. If the pattern continues, how deep will the puddle be after it rains for 45 min?

9-4

Practice

Form K

Arithmetic Series

Identify each list as a *series* or a *sequence* and *finite* or *infinite*.

1. 2, 6, 10, 14, ...

2. $1 + 4 + 7 + 10 + 13$

3. 4, 10, 16, 22, 28

4. $5 + 12 + 19 + 26 + 33$

5. $1.4 + 1.1 + 0.8 + 0.5 + \dots$

6. $-2 - 11 - 20 - 29 - \dots$

Find the sum of each finite arithmetic series.

7. $1 + 3 + 5 + \dots + 99$

8. $3 + 7 + 11 + 15 + \dots + 55$

Find the number of terms. Find the sum.

Find the number of terms. Find the sum.

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

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

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

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

$$99 = 1 + (n - 1)2$$

$$S_{50} = \frac{50}{2}(1 + 99)$$

$$99 = 1 + 2n - 2$$

$$= 25(100)$$

$$100 = 2n$$

$$= \boxed{}$$

$$50 = n$$

9. $106 + 101 + 96 + \dots + 1$

10. $2 + 10 + 18 + \dots + 378$

11. $(-4) + (-9) + (-14) + \dots + (-99)$

12. Reasoning Is it possible to find the sum of an infinite arithmetic series? Explain.

9-4

Practice (continued)

Form K

Arithmetic Series

Write each arithmetic series in summation notation.

13. $3 + 8 + 13 + \dots + 268$

Find an explicit formula for the n th term.

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

$$a_n = 3 + (n - 1)5$$

$$a_n = 5n - 2$$

Find the value of n for 268.

$$268 = 5n - 2$$

$$270 = 5n$$

$$54 = n$$

Write the summation notation.

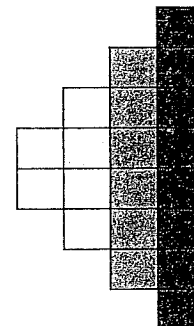
$$\sum_{n=1}^{\square} (\square)$$

14. $1 + 7 + 13 + \dots + 343$

15. $5 + 7 + 9 + \dots + 131$

16. Tabitha used tiles to make the design shown at the right. The first column has 2 tiles, the second column has 4 tiles, and the pattern continues.

- Write an explicit formula for the sequence.
- Write the summation notation for a related series with 24 tiles in the 12th column.
- How many tiles are in the design if there are a total of 12 columns?



17. Your brother is preparing for basketball season. He shot 26 baskets on the first day that he practiced. He shot 32 baskets on the second day and 38 baskets the day after that.

- If this pattern continues, how many baskets will he shoot on the 30th day?
- How many baskets will he have shot during those 30 days?