12.3 EXERCISES

HOMEWORK KEY

○ = **WORKED-OUT SOLUTIONS**
on p. WS1 for Exs. 19, 49, and 59

🔻 = **TAKS PRACTICE AND REASONING**
Exs. 27, 54, 55, 59, 63, and 64

◆ = **MULTIPLE REPRESENTATIONS**
Ex. 61

SKILL PRACTICE

1. **VOCABULARY** Copy and complete: The constant ratio of consecutive terms in a geometric sequence is called the __?__ .

2. **WRITING** How can you determine whether a sequence is geometric?

EXAMPLE 1
on p. 810
for Exs. 3–14

IDENTIFYING GEOMETRIC SEQUENCES Tell whether the sequence is geometric. *Explain* why or why not.

3. $1, 4, 8, 16, 32, \ldots$

4. $4, 16, 64, 256, 1024, \ldots$

5. $216, 36, 6, 1, \dfrac{1}{6}, \ldots$

6. $\dfrac{1}{3}, \dfrac{2}{3}, \dfrac{4}{3}, \dfrac{8}{3}, \dfrac{16}{3}, \ldots$

7. $\dfrac{1}{2}, 1, \dfrac{3}{2}, 2, \dfrac{5}{2}, \ldots$

8. $-\dfrac{1}{4}, \dfrac{3}{8}, -\dfrac{3}{16}, \dfrac{1}{32}, -\dfrac{3}{64}, \ldots$

9. $10, 5, 2.5, 1.25, 0.625, \ldots$

10. $-3, -6, 12, 24, -48, \ldots$

11. $-4, 12, -36, 108, -324, \ldots$

12. $0.2, 0.6, 1.8, 5.4, 16.2, \ldots$

13. $-5, 10, 20, 40, 80, \ldots$

14. $0.75, 1.5, 2.25, 3, 3.75, \ldots$

EXAMPLE 2
on p. 811
for Exs. 15–27

WRITING RULES Write a rule for the nth term of the geometric sequence. Then find a_7.

15. $1, -4, 16, -64, \ldots$

16. $6, 18, 54, 162, \ldots$

17. $4, 24, 144, 864, \ldots$

18. $7, -35, 175, -875, \ldots$

⑲ $2, \dfrac{3}{2}, \dfrac{9}{8}, \dfrac{27}{32}, \ldots$

20. $3, -\dfrac{6}{5}, \dfrac{12}{25}, -\dfrac{24}{125}, \ldots$

21. $4, 2, 1, 0.5, \ldots$

22. $-0.3, 0.6, -1.2, 2.4, \ldots$

23. $-2, -0.8, -0.32, -0.128, \ldots$

24. $7, -4.2, 2.52, -1.512, \ldots$

25. $5, -14, 39.2, -109.76, \ldots$

26. $120, 180, 270, 405, \ldots$

27. 🔻 **TAKS REASONING** What is a rule for the nth term of the geometric sequence $5, 20, 80, 320, \ldots$?

(A) $a_n = 5(2)^{n-1}$

(B) $a_n = 5(4)^{n-1}$

(C) $a_n = 5(-4)^{n-1}$

(D) $a_n = 5(-2)^{n-1}$

EXAMPLE 3
on p. 811
for Exs. 28–38

WRITING RULES Write a rule for the nth term of the geometric sequence. Then graph the first six terms of the sequence.

28. $a_1 = 5, r = 3$

29. $a_1 = -2, r = 6$

30. $a_2 = 6, r = 2$

31. $a_2 = 15, r = \dfrac{1}{2}$

32. $a_5 = 1, r = \dfrac{1}{8}$

33. $a_4 = -12, r = -\dfrac{1}{4}$

34. $a_3 = 75, r = 5$

35. $a_2 = 8, r = 4$

36. $a_4 = 500, r = 5$

ERROR ANALYSIS *Describe* and correct the error in writing the rule for the nth term of the geometric sequence for which $a_1 = 3$ and $r = 2$.

37.

$$a_n = a_1 r^n$$
$$a_n = 3(2)^n$$

38.

$$a_n = r a_1^{n-1}$$
$$a_n = 2(3)^{n-1}$$