

7.2 Practice Set

1. What is the difference between an arithmetic sequence and a geometric sequence? Give an example of each.

Given each sequence described by the general formula below, give the 15th term. Can you tell by looking at the form of the general term whether the sequence is arithmetic, geometric, or neither?

2. $a_n = 2n + 5$

3. $a_n = 3^{n-1}$

4. $a_n = n^2 + 7n - 2$

5. $a_n = -4 \cdot 2^{n-1}$

6. $a_n = \frac{1}{n}$

7. $a_n = \frac{5}{2}n$

8. $a_n = \frac{2}{3}n^3$

9. $a_n = (-1)^n$

10. $a_n = 3 - 4n$

11. $a_n = \frac{(-1)^n}{n+1}$

12. $a_n = \frac{1}{n^2}$

Determine whether each sequence is arithmetic, geometric, or neither. If arithmetic or geometric, give the common difference or ratio and the general term a_n . For any sequence that is neither, see if you can find the pattern.

13. $\{3, 6, 9, 12, 15, \dots\}$

14. $\{2, 4, 8, 16, 32, \dots\}$

15. $\{1, 7, 8, 15, 23, 38, \dots\}$

16. $\{-1, 5, -25, 125, -625, \dots\}$

17. $\left\{\frac{3}{4}, \frac{1}{2}, \frac{1}{3}, \frac{2}{9}, \frac{4}{27}, \frac{8}{81}, \dots\right\}$

18. $\{8, 4, 0, -4, -8, -12, \dots\}$

19. $\left\{\frac{1}{4}, \frac{1}{2}, \frac{3}{4}, 1, \frac{5}{4}, \frac{3}{2}, \dots\right\}$

20. $\left\{1, \frac{1}{4}, \frac{1}{9}, \frac{1}{16}, \frac{1}{25}, \frac{1}{36}, \dots\right\}$

Distributed Practice Problems

Find the inverse of each of the following one-to-one functions and graph both functions on the same set of axes. State any domain restrictions that exist for the inverse function.

21. $g(x) = \sqrt{x} + 4$

22. $y = (x + 3)^2 - 1; \quad x \geq -3$

For each of the following pairs of functions, perform the following operations and give any restrictions on the domain of the resulting function:

$(f + g)(x)$, $(f - g)(x)$, $(f \cdot g)(x)$, and $(\frac{f}{g})(x)$.

23.
$$\begin{cases} f(x) = 6x^2 - 3x \\ g(x) = x - 2 \end{cases}$$

24.
$$\begin{cases} f(x) = x^3 + 27 \\ g(x) = x + 3 \end{cases}$$

Graph the following function. Give the x-intercept(s), y-intercept, domain, range, and the equation(s) of any asymptote(s).

25.
$$y^2 + 4x^2 + 8x = 15$$