Geometry

Inductive Reasoning – Practice

Find a pattern for each sequence. Use that pattern to determine the next two terms.

1. 5, 11, 18, 26, . . .


3. −3, 6, −12, 24, −48, . . .

4. 1, 5, 30, 210, 1680, . . .

5. ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲

6. Use inductive reasoning to make a conjecture about the sequence below:

Sequence A:

a) How many sides does the fifth figure in Sequence A have? 7
b) How many sides does the tenth figure in Sequence A have? 12
c) How many sides does the fourteenth figure in Sequence A have? 16

7. Use inductive reasoning to make a conjecture about the sequence below:

Sequence B: −5, 4, −2, −5, 4, −2, −5, 4, −2, . . .

a) What is the tenth term of Sequence B? −5
b) What is the fifteenth term of Sequence B? −2
Finish writing the conjecture for each scenario. Show your work.

8. The square of an odd number is an \textbf{odd} number.
   
   \[
   \begin{align*}
   1^2 &= 1 \\
   3^2 &= 9 \\
   5^2 &= 25 \\
   7^2 &= 49 \\
   9^2 &= 81 \\
   11^2 &= 121
   \end{align*}
   \]

9. The cube of a negative number is a \textbf{negative} number.

   \[
   \begin{align*}
   (-1)^3 &= -1 \\
   (-2)^3 &= -8 \\
   (-3)^3 &= (-\#)(-\#)(-\#) = -
   \end{align*}
   \]

10. The product of two even numbers is an \textbf{even} number.

    \[
    \begin{align*}
    (2)(4) &= 8 \\
    (2)(8) &= 16
    \end{align*}
    \]

11. The sum of two odd numbers is an \textbf{even} number.

    \[
    \begin{align*}
    (2n+1) + (2n+1) &= 2n + 2k + 2 \\
    &= 2(n + k + 1)
    \end{align*}
    \]

Find a pattern for each sequence. Use that pattern to determine the next two terms.

12. \(3, 5, 9, 17, \ldots, 65\)

13. \(1, 4, 6, 24, 26, \ldots, 104, 106\)

14. \(5, 3, 9, 7, 21, \ldots, 57\)

15. \(-1, -2, 2, -4, 0, \ldots, -2\)

16. \(0.3, -0.09, 0.0027, \ldots, -0.0000081\)

17. \(\frac{2}{3}, \frac{4}{9}, \frac{8}{27}, \ldots, \frac{16}{81}, \frac{32}{243}\)

18. \(2, 3, 5, 8, 13, 21, \ldots, 55\)

19. \(4, 7, 12, 19, 28, \ldots, 57\)