

Practice Test

- Find the next four terms of the arithmetic sequence 42, 37, 32,
- Find the 27th term of an arithmetic sequence for which $a_1 = 2$ and $d = 6$.
- MULTIPLE CHOICE** What is the tenth term in the arithmetic sequence that begins 10, 5.6, 1.2, -3.2, ... ?
 A -39.6
 B -29.6
 C 29.6
 D 39.6
- Find the three arithmetic means between -4 and 16.
- Find the sum of the arithmetic series for which $a_1 = 7$, $n = 31$, and $a_n = 127$.
- Find the next two terms of the geometric sequence $\frac{1}{81}, \frac{1}{27}, \frac{1}{9}, \dots$.
- Find the sixth term of the geometric sequence for which $a_1 = 5$ and $r = -2$.
- MULTIPLE CHOICE** Find the next term in the geometric sequence 8, 6, $\frac{9}{2}$, $\frac{27}{8}$,
 F $\frac{11}{8}$
 G $\frac{27}{16}$
 H $\frac{9}{4}$
 J $\frac{81}{32}$
- Find the two geometric means between 7 and 189.
- Find the sum of the geometric series for which $a_1 = 125$, $r = \frac{2}{5}$, and $n = 4$.

Find the sum of each series, if it exists.

- $\sum_{k=3}^{15} (14 - 2k)$
- $\sum_{n=1}^{\infty} \frac{1}{3}(-2)^{n-1}$
- $91 + 85 + 79 + \dots + (-29)$
- $12 + (-6) + 3 + \left(-\frac{3}{2}\right) + \dots$

Find the first five terms of each sequence.

- $a_1 = 1, a_{n+1} = a_n + 3$
- $a_1 = -3, a_{n+1} = a_n + n^2$
- Find the first three iterates of $f(x) = x^2 - 3x$ for an initial value of $x_0 = 1$.
- Expand $(2s - 3t)^5$.
- What is the coefficient of the fifth term of $(r + 2q)^7$?
- Find the third term of the expansion of $(x + y)^{10}$.

Prove that each statement is true for all positive integers.

- $1 + 7 + 49 + \dots + 7^{n-1} = \frac{1}{6}(7^n - 1)$
- $14^n - 1$ is divisible by 13.
- Find a counterexample for the following statement.
The units digit of $7^n - 3$ is never 8.
- DESIGN** The pattern in a red and white brick wall starts with 20 red bricks on the bottom row. Each row contains 3 fewer red bricks than the row below. If the top row has no red bricks, how many rows are there and how many red bricks were used?
- RECREATION** One minute after it is released, a gas-filled balloon has risen 100 feet. In each succeeding minute, the balloon rises only 50% as far as it rose in the previous minute. How far will it rise in 5 minutes?