

Arithmetic Sequences and Series

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

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

Find the first five terms of each arithmetic sequence described.

1.) $a_1 = -12, d = -4$

_____, _____, _____, _____, _____

2.) $a_1 = \frac{5}{6}, d = \frac{1}{3}$

_____, _____, _____, _____, _____

Find the next three terms of each arithmetic sequence described.

3.) 107, 98, 89, _____, _____, _____

4.) $a_1 = 3, d = \frac{1}{2}, a_2 = \text{_____}, a_3 = \text{_____}, a_4 = \text{_____}$

Find the indicated term of each arithmetic sequence.

5.) Find a_{10} . $a_1 = 5, d = 3, n = 10$

6.) Find a_{18} . $-6, -7, -8, \dots$

7.) Find a_{20} . $a_2 = 5, d = -2, n = 20$

8.) Find a_{35} . $134, 112, 90, \dots$

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

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

9.) 166 is the _____th term of this sequence: 30, 34, 38, ...

10.) Find the arithmetic means of the sequence.

23, _____, _____, _____, 67

11.) Find the arithmetic means of the sequence.

_____, -5, _____, _____, 4, _____

Find the sum, S_n , of each arithmetic series. (Hint: You may have to use arithmetic seq. formula first to find n .)

12.) $5 + 7 + 9 + 11 + \dots + 27$

13.) $-4 + 1 + 6 + 11 + \dots + 91$

14.) $a_1 = 32, a_n = 12, n = 6$

15.) $a_1 = 62, d = 12, n = 7$

16.) $\sum_{k=1}^{10} (2k + 3)$

17.) $\sum_{k=3}^7 (4k - 10)$

18.) A supermarket display consists of 6 rows of stacked boxes. The top row has 35 boxes in it. Each row below has 3 more boxes than the row above it. How many boxes are in the display? (Hint: $a_1 = 35, d = 3, n = 6$)

Geometric Sequences and Series Geometric Sequence $a_n = a_1 \cdot r^{n-1}$

Geometric Sum $S_n = \frac{a_1(1-r^n)}{1-r}$ or $S_n = \frac{a_1 - a_n r}{1-r}$

Find the next two terms of each geometric sequence.

19.) - 15, - 30, - 60, ...

20.) 80, 40, 20, ...

21.) - 4864, 1216, -304, _____, _____

22.) $\frac{1}{2}, \frac{3}{8}, \frac{9}{32},$ _____, _____

Find the indicated term of each geometric sequence.

23.) Find a_6 . $a_1 = 5, r = 3, n = 6$

24.) Find a_4 . $a_1 = 20, r = -3, n = 4$

25.) Find a_8 . $a_3 = -20, r = -2, n = 8$

26.) Find a_8 . $a_4 = 16, n = 8, r = 0.5$

27.) Find the geometric means of the sequence. 9, _____, _____, -243

Geometric Sequence $a_n = a_1 \cdot r^{n-1}$

Geometric Sum $S_n = \frac{a_1(1-r^n)}{1-r}$ or $S_n = \frac{a_1 - a_n r}{1-r}$

Find the sum S_n of each geometric series.

28.) $162 + 54 + 18 + \dots$ to 6 terms

29.) $2 + 4 + 8 + \dots$ to 8 terms

Find the sum S_n of each geometric series.

30.) $a_1 = 5, r = 3, n = 12$

31.) $a_3 = 8, a_5 = 2, n = 6$

32.) List out the terms of this geometric series, but do not find the sum.

$$\sum_{n=1}^6 3(2)^n$$

33.) Find the sum. $\sum_{n=2}^5 (-3)^{n-1}$

34.) As a hot-air balloon rises from the earth's surface, the air in the balloon cools. If the air is not reheated, the balloon rises more slowly with each minute of flight. Suppose after 1 minute, a hot-air balloon rises 120 feet. In each succeeding minute, the balloon rises only 60% as far as it rose the previous minute. How far will the balloon rise in 10 minutes? (Hint: $a_1 = 120, r = 0.60, n = 10$)