

Arithmetic Series

Find the sum of the series associated with the given sequence.

1) $11, \frac{25}{2}, 14, \frac{31}{2}, 17$

70

2) $-11, -13, -15, -17, -19$

-75

3) $-\frac{7}{3}, -\frac{2}{3}, 1, \frac{8}{3}, \frac{13}{3}, 6$

11

4) $9.5, 11.8, 14.1, 16.4, 18.7$

70.5

Evaluate each arithmetic series described.

5) $\sum_{n=4}^{23} \left(-\frac{13}{10} + \frac{1}{2}n \right)$

109

6) $\sum_{i=4}^{17} (2i - 5)$

224

7) $\sum_{i=4}^{18} (5i + 5)$

900

8) $\sum_{i=1}^{17} (6 - 2i)$

204

9) $\sum_{m=5}^{24} (9m - 1)$

2590

10) $\sum_{n=1}^{33} (0.8n + 6.3)$

656.7

11) $a_1 = 7, d = 6, n = 9$

279

12) $a_1 = -3, d = -4, n = 9$

-171

13) $4 + 6 + 8 + 10 \dots, n = 17$

340

1629

Evaluate each series.

15) $\sum_{m=1}^7 (3m^2 + 3)$

441

16) $\sum_{n=4}^9 (30 - n^2)$

-91

Determine the number of terms n in each arithmetic series.

17) $a_1 = 6, a_n = 31, S_n = 111$

6

18) $14 + 24 + 34 + 44 \dots, S_n = 2180$

20

Rewrite each series using sigma notation.

19) $5 + 10 + 15 + 20$

$\sum_{n=1}^4 5n$

20) $5 + 8 + 11 + 14 + 17 + 20$

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

Determine the number of terms n in each arithmetic series.

21) $11.3 + 12.2 + 13.1 + 14 \dots, S_n = 134.1$

9

22) $9 + 12 + 15 + 18 \dots, S_n = 561$

17

Pre-Calculus

Geometric Series

Evaluate each geometric series described.

1) $2 - 12 + 72 - 432 \dots, n = 7$

$$79982$$

3) $-1 + 4 - 16 + 64 \dots, n = 6$

$$819$$

5) $\sum_{i=1}^7 -2 \cdot (-5)^{i-1}$

$$-26042$$

7) $\sum_{k=1}^9 3^{k-1}$

$$9841$$

9) $\sum_{k=1}^7 3^{k-1}$

$$1093$$

2) $-1 - 5 - 25 - 125 \dots, n = 9$

$$-488,281$$

4) $-4 - 20 - 100 - 500 \dots, n = 6$

$$-15624$$

6) $\sum_{i=1}^8 2^{i-1}$

$$255$$

8) $\sum_{m=1}^8 3 \cdot 2^{m-1}$

$$765$$

10) $\sum_{m=1}^{10} 4^{m-1}$

$$349,525$$

Determine the number of terms n in each geometric series.

11) $a_1 = 4, r = -5, S_n = -10416$

$$n = 6$$

12) $a_1 = -1, r = 2, S_n = -7$

$$n = 3$$

13) $a_1 = -4, r = -6, S_n = -159964$

$$n = 7$$

14) $a_1 = 1, r = 3, S_n = 121$

$$n = 5$$

Determine if each geometric series converges or diverges.

15) $\frac{32}{81} - \frac{16}{27} + \frac{8}{9} - \frac{4}{3} \dots$ **Div**

16) $\frac{7}{6} + \frac{7}{18} + \frac{7}{54} + \frac{7}{162} \dots$ **Con**

17) $1 + 4 + 16 + 64 \dots$ **Div**

18) $4 - 8 + 16 - 32 \dots$ **Div**

19) $-6 - 3 - \frac{3}{2} - \frac{3}{4} \dots$ **Con**

20) $\frac{135}{8} + \frac{45}{4} + \frac{15}{2} + 5 \dots$ **Con**

21) $\sum_{n=1}^{\infty} -64 \cdot \left(\frac{1}{2}\right)^{n-1}$ **Con**

22) $\sum_{k=1}^{\infty} -4 \cdot \left(\frac{1}{5}\right)^{k-1}$ **Con**

Evaluate each infinite geometric series described.

23) $1 + 0.6 + 0.36 + 0.216 \dots$

24) $-250 + 50 - 10 + 2 \dots$

$r = 0.6$
2.5

-208.33

25) $1 - 2 + 4 - 8 \dots$

div

26) $1 + \frac{3}{4} + \frac{9}{16} + \frac{27}{64} \dots$

4

27) $\sum_{i=1}^{\infty} 0.8^{i-1}$

5

28) $\sum_{n=1}^{\infty} -\frac{81}{16} \cdot \left(\frac{2}{3}\right)^{n-1}$

-15.1875

29) $\sum_{k=1}^{\infty} \frac{3}{2} \cdot \left(\frac{1}{4}\right)^{k-1}$

2

30) $\sum_{k=1}^{\infty} \left(\frac{1}{3}\right)^{k-1}$

$r = 1/3$

Determine the common ratio of the infinite geometric series.

31) $a_1 = -4.2, S = -21$

$r = 0.8$

32) $a_1 = 4, S = 8$

$r = 1/2$

33) $a_1 = 1, S = \frac{2}{3}$

$r = -1/2$

34) $a_1 = 1, S = \frac{4}{3}$

$r = 1/4$