

## Sequences and Series

**Find the next three terms in each sequence.**

1) 51, 01, 6, 3, 1, ...

2) -4, -8, -16, -32, -64, ...

**Find the first four terms in each sequence.**

3)  $a_n = 4 \cdot 3 = n^{1-}$

4)  $a_n = -\frac{6}{n+3}$

5)  $a_n = a_{n-1} \cdot -5$   
 $a_1 = 0.4$

6)  $a_n = a_{n-1} \cdot 3$   
 $a_1 = 3$

**Find the tenth term in each sequence.**

7)  $a_n = -\frac{15}{n}$

8)  $a_n = a_{n-1} + n$   
 $a_1 = -8$

**Determine if each sequence converges or diverges.**

9) -30, -14, -6, -2, 0, ...

10) 8, 108, 208, 308, 408, ...

11)  $a_n = \frac{6}{n+3}$

12)  $a_n = -4 \cdot (-4)^{n-1}$

13)  $a_n = a_{n-1} \cdot 2$   
 $a_1 = 3$

14)  $a_n = \frac{2 + a_{n-1}}{2}$   
 $a_1 = -30$

**Rewrite each series as a sum.**

$$15) \sum_{n=1}^4 (20 - n^2)$$

$$16) \sum_{n=1}^4 (n + 600)$$

$$17) \sum_{m=1}^4 \frac{1}{3^m}$$

$$18) \sum_{a=1}^6 \frac{a^2 + 1}{a}$$

**Evaluate each series.**

$$19) \sum_{m=5}^{11} (m + 400)$$

$$20) \sum_{n=1}^5 \frac{10}{n}$$

$$21) \sum_{k=1}^6 \frac{300}{k}$$

$$22) \sum_{n=0}^5 (20 - n)$$

$$23) \sum_{k=1}^5 (200 - k^2)$$

$$24) \sum_{n=2}^8 n$$

$$25) \sum_{n=3}^9 \frac{1}{n}$$

$$26) \sum_{a=1}^7 \frac{a}{a+1}$$

**Rewrite each series using sigma notation.**

$$27) 1 + 4 + 9 + 16 + 25$$

$$28) 1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5}$$

$$29) \frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \frac{1}{81} + \frac{1}{243} + \frac{1}{729}$$

$$30) 5 + 10 + 15 + 20 + 25$$

$$31) \frac{1}{2} + \frac{2}{3} + \frac{3}{4} + \frac{4}{5} + \frac{5}{6}$$

$$32) 5 + 25 + 125 + 625 + 3125$$

## Sequences and Series

Find the next three terms in each sequence.

1) 1, 3, 6, 10, 15, ...

21, 28, 36

2) -4, -8, -16, -32, -64, ...

-128, -256, -512

Find the first four terms in each sequence.

3)  $a_n = 3 \cdot 4^{n-1}$

3, 12, 48, 192

4)  $a_n = -\frac{6}{n+3}$

 $-\frac{3}{2}, -\frac{6}{5}, -1, -\frac{6}{7}$ 

5)  $a_n = a_{n-1} \cdot -5$

$a_1 = 0.4$

0.4, -2, 10, -50

6)  $a_n = a_{n-1} \cdot 3$

$a_1 = 3$

3, 9, 27, 81

Find the tenth term in each sequence.

7)  $a_n = -\frac{15}{n}$

$a_{10} = -\frac{3}{2}$

8)  $a_n = a_{n-1} + n$

$a_1 = -8$

$a_{10} = 46$

Determine if each sequence converges or diverges.

9) -30, -14, -6, -2, 0, ...

Converges

10) 8, 108, 208, 308, 408, ...

Diverges

11)  $a_n = \frac{6}{n+3}$

Converges

12)  $a_n = -4 \cdot (-4)^{n-1}$

Diverges

13)  $a_n = a_{n-1} \cdot 2$

$a_1 = 3$

Diverges

14)  $a_n = \frac{2 + a_{n-1}}{2}$

$a_1 = -30$

Converges

**Rewrite each series as a sum.**

$$15) \sum_{n=1}^4 (20 - n^2)$$

$$19 + 16 + 11 + 4$$

$$16) \sum_{n=1}^4 (n + 600)$$

$$601 + 602 + 603 + 604$$

$$17) \sum_{m=1}^4 \frac{1}{3^m}$$

$$\frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \frac{1}{81}$$

$$18) \sum_{a=1}^6 \frac{a^2 + 1}{a}$$

$$2 + \frac{5}{2} + \frac{10}{3} + \frac{17}{4} + \frac{26}{5} + \frac{37}{6}$$

**Evaluate each series.**

$$19) \sum_{m=5}^{11} (m + 400)$$

$$2856$$

$$20) \sum_{n=1}^5 \frac{10}{n}$$

$$\frac{137}{6}$$

$$21) \sum_{k=1}^6 \frac{300}{k}$$

$$735$$

$$22) \sum_{n=0}^5 (20 - n)$$

$$105$$

$$23) \sum_{k=1}^5 (200 - k^2)$$

$$945$$

$$24) \sum_{n=2}^8 n$$

$$35$$

$$25) \sum_{n=3}^9 \frac{1}{n}$$

$$\frac{3349}{2520}$$

$$26) \sum_{a=1}^7 \frac{a}{a+1}$$

$$\frac{1479}{280}$$

**Rewrite each series using sigma notation.**

$$27) 1 + 4 + 9 + 16 + 25 \quad \sum_{m=1}^5 m^2$$

$$28) 1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} \quad \sum_{k=1}^5 \frac{1}{k}$$

$$29) \frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \frac{1}{81} + \frac{1}{243} + \frac{1}{729} \quad \sum_{k=1}^6 \frac{1}{3^k}$$

$$30) 5 + 10 + 15 + 20 + 25 \quad \sum_{n=1}^5 5n$$

$$31) \frac{1}{2} + \frac{2}{3} + \frac{3}{4} + \frac{4}{5} + \frac{5}{6} \quad \sum_{a=1}^5 \frac{a}{a+1}$$

$$32) 5 + 25 + 125 + 625 + 3125 \quad \sum_{a=1}^5 5^a$$