Name_____

Sequences and Series

Date_____ Period____

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

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

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

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

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

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