Algebra II/Trig Name _____

HW25: 2.4 Geometric Sequences

Write the first six terms of each geometric sequence.

1. $a_1 = 20$, $r = \frac{1}{2}$

2. $a_1 = 4$, $r = 3$

Use the formula for the general term (*n*th term) of a geometric sequence to find the indicated term of each sequence with the given first term, a_1, and common ratio, *r*.

3. Find a_8 when $a_1 = 6$, $r = 2$.

4. Find a_{12} when $a_1 = 5$, $r = -2$.

5. Find a_{22} when $a_1 = 1000$, $r = -\frac{1}{2}$.

6. Find a_{15} when $a_1 = 9000$, $r = -\frac{1}{3}$

Write a formula for the *n*th term of each geometric sequence. Then use the formula to find a_7.

7. 3, 12, 48, 192, ……

8. 3, 15, 75, 375, ……

Write a formula for the *n*th term of each geometric sequence. Then use the formula to find a_7.

9. $18, 6, 2, \frac{2}{3}, ...$

10. $18, 6, 2, \frac{2}{3}, ...$

11. Find the sum of the first 12 terms of the geometric sequence: 2, 6, 18, 54, …..

12. Find the sum of the first 11 terms of the geometric sequence: 3, –6, 12, –24,…..

13. Find the sum of the first 14 terms of the geometric sequence: $-\frac{3}{2}, 3, -6, 12, ...$

Find the indicated sum.

14. $\sum_{i=3}^{8} 3^i$

15. $\sum_{i=1}^{10} 5 \cdot 2^i$

16. $\sum_{i=2}^{6} \left(\frac{1}{2}\right)^{i+1}$

Find the sum of each infinite geometric series.

17. $1+\frac{1}{3}+\frac{1}{9}+\frac{1}{27}+.....$

18. $1-\frac{1}{2}+\frac{1}{4}-\frac{1}{8}+.....$

19. A culture of bacteria doubles every 2 hours. If there are 500 bacteria at the beginning, how many bacteria will there be after 24 hours?

Answers

1. $20,10,5,\frac{5}{2},\frac{5}{4}$
2. 4, 12, 36, 108, 324
3. $a_8 = 768$
4. $a_{12} = -10,240$
5. $a_{22} = -\frac{125}{262144}$
6. $a_{15} = \frac{1000}{531441}$
7. $a_n = 3(4)^{n-1},\ a_7 = 12,288$
8. $a_n = 3(5)^{n-1},\ a_7 = 46,875$
9. $a_n = 18\left(\frac{1}{3}\right)^{n-1},\ a_7 = \frac{2}{81}$
10. $a_n = 12\left(\frac{1}{2}\right)^{n-1},\ a_7 = \frac{3}{16}$
11. $S_{12} = 531,440$
12. $S_{11} = 2049$
13. $S_{14} = \frac{16,383}{2}$
14. $S_6 = 9828$
15. $S_{10} = 10,230$
16. $S_5 = \frac{31}{128}$
17. $\frac{3}{2}$
18. $\frac{2}{3}$
19. $a_{13} = 2,048,000$ bacteria