Geometric Series Assignment

Date_____ Period____

Write a formula for the nth term. Evaluate each geometric series described by finding the sum of the nth term.

1) $16 + 8 + 4 + 2..., \ n = 6$

2) $-2 + 10 - 50 + 250..., \ n = 8$

Determine if each geometric series converges or diverges.

3) $5 + 1 + \frac{1}{5} + \frac{1}{25}...$

4) $1 + \frac{1}{3} + \frac{1}{9} + \frac{1}{27}...$

5) $-3 - 9 - 27 - 81...$

6) $16 + 8 + 4 + 2...$

7) $\frac{1}{5} - \frac{1}{20} + \frac{1}{80} - \frac{1}{320}...$

8) $2 - 6 + 18 - 54...$

Evaluate each infinite geometric series described.

9) $1 - \frac{1}{4} + \frac{1}{16} - \frac{1}{64}...$

10) $4 + \frac{4}{5} + \frac{4}{25} + \frac{4}{125}...$

11) $6 + 3 + \frac{3}{2} + \frac{3}{4}...$

12) $1 + 3 + 9 + 27...$

13) $8 - 4.8 + 2.88 - 1.728...$

14) $-4 - \frac{4}{3} - \frac{4}{9} - \frac{4}{27}...$

Determine whether the sequence is arithmetic or geometric. Find the tenth term in each sequence.

15) 23, 223, 423, 623, 823, ...

16) 4, 12, 36, 108, 324, ...

Evaluate the related series of each sequence.

17) 8.1, 9.5, 10.9, 12.3

18) 37, 44, 51, 58, 65, 72

For each sequence, state if it is arithmetic, geometric, or neither.

19) 2, 6, 10, 14, 18, ...

20) 2, −8, 32, −128, 512, ...

21) 3, −6, 12, −24, 48, ...

Determine whether the sequence is arithmetic or geometric. Write the explicit formula for each sequence.

22) −13, −113, −213, −313, −413, ...

23) 3, 12, 48, 192, 768, ...

24) Worldwide consumption of oil was about 81 billion barrels in 2004.7 Assume that consumption continues to increase at 1.2% per year, the rate for the previous decade.

(a) Write a sum representing the total oil consumption for 25 years, starting with 2004.

(b) Evaluate this sum.

25) Atenolol is taken in 50-mg doses once a day to lower blood pressure and body metabolizes the drug at a rate of 6.25% per day.

A. What is the amount present at the end of a day?

B. How much is in your system after 30 days?

C. Compare your answers for a and b.

PreCalculus Unit 10 Name_____ ID: 1

Geometric Series Assignment

Date_____ Period____

Write a formula for the nth term. Evaluate each geometric series described by finding the sum of the nth term.

1) $16 + 8 + 4 + 2..., \ n = 6$ $\frac{63}{2}$

2) $-2 + 10 - 50 + 250..., \ n = 8$

130208

Determine if each geometric series converges or diverges.

3) $5 + 1 + \frac{1}{5} + \frac{1}{25}...$

Converges

4) $1 + \frac{1}{3} + \frac{1}{9} + \frac{1}{27}...$

Converges

5) $-3 - 9 - 27 - 81...$

Diverges

6) $16 + 8 + 4 + 2...$

Converges

7) $\frac{1}{5} - \frac{1}{20} + \frac{1}{80} - \frac{1}{320}...$

Converges

8) $2 - 6 + 18 - 54...$

Diverges

Evaluate each infinite geometric series described.

9) $1 - \frac{1}{4} + \frac{1}{16} - \frac{1}{64}...$ $\frac{4}{5}$

10) $4 + \frac{4}{5} + \frac{4}{25} + \frac{4}{125}...$

5

11) $6 + 3 + \frac{3}{2} + \frac{3}{4}...$

12

12) $1 + 3 + 9 + 27...$

No sum

13) $8 - 4.8 + 2.88 - 1.728...$

5

14) $-4 - \frac{4}{3} - \frac{4}{9} - \frac{4}{27}...$

−6

Determine whether the sequence is arithmetic or geometric. Find the tenth term in each sequence.

15) 23, 223, 423, 623, 823, ...

$a_{10} = 1823$

16) 4, 12, 36, 108, 324, ...

$a_{10} = 78732$

Evaluate the related series of each sequence.

17) 8.1, 9.5, 10.9, 12.3

40.8

18) 37, 44, 51, 58, 65, 72

327

For each sequence, state if it is arithmetic, geometric, or neither.

19) 2, 6, 10, 14, 18, ...

Arithmetic

20) 2, −8, 32, −128, 512, ...

Geometric

21) 3, −6, 12, −24, 48, ...

Geometric

Determine whether the sequence is arithmetic or geometric. Write the explicit formula for each sequence.

22) −13, −113, −213, −313, −413, ...

$a_n = 87 - 100n$

23) 3, 12, 48, 192, 768, ...

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

24) Worldwide consumption of oil was about 81 billion barrels in 2004.7 Assume that consumption continues to increase at 1.2% per year, the rate for the previous decade.

(a) Write a sum representing the total oil consumption for 25 years, starting with 2004.

(b) Evaluate this sum.

$S_{25} = 81 \cdot \frac{1 - 1.012^{25}}{1 - 1.012}$, 2345 billion barrels

25) Atenolol is taken in 50-mg doses once a day to lower blood pressure and body metabolizes the drug at a rate of 6.25% per day.

A. What is the amount present at the end of a day?

B. How much is in your system after 30 days?

C. Compare your answers for a and b.

The dot next to the choice indicates that it is the answer.