Lesson 5 Homework: Infinite Geometric Series

Period____

Determine whether each infinite geometric series has a finite sum. If so, find the sum.

1) $2 + 3 + 4.5 + 6.75 + ...$

2) $-0.5 - 0.05 - 0.005 - 0.0005 - ...$

3) $\dfrac{1}{2} - \dfrac{3}{8} + \dfrac{9}{32} - \dfrac{27}{128} + ...$

4) $0.1 + 0.2 + 0.4 + 0.8 + ...$

Write the first 4 terms of each infinite geometric series.

5) $t_1 = 4$ and $r = \dfrac{1}{5}$

6) $t_1 = \dfrac{3}{2}$ and $r = -\dfrac{3}{8}$

Determine the sum of each of the infinite geometric series.

7) $8 + 2 + 0.5 + 0.125 + ...$

8) $-1 - \dfrac{3}{4} - \dfrac{9}{16} - \dfrac{27}{64} - ...$

9) $10 - \dfrac{20}{3} + \dfrac{40}{9} - \dfrac{80}{27} + \ldots$

10) $-2 + \dfrac{2}{3} - \dfrac{2}{9} + \dfrac{2}{27} - \ldots$

Write a sentence to answer each question.

11) By looking at the common ratio, how do we know that the series is convergent?

12) By looking at the common ratio, how do we know that the series is divergent?

Find the indicated value.

13) $t_1 = 21$ and $S_\infty = 63$; Find r

14) $r = \dfrac{3}{4}$ and $S_\infty = \dfrac{24}{7}$

Use an infinite geometric series to express each repeating decimal as a fraction.

15) $0.4979797\ldots$

16) $1.143143143\ldots$

MATH 11 - Pre Calculus   UNIT: Series & Sequences   Name_____

Lesson 5 Homework: Infinite Geometric Series

Period____

Determine whether each infinite geometric series has a finite sum. If so, find the sum.

1) $2 + 3 + 4.5 + 6.75 + ...$

No. r = 1.5 so series diverges.

2) $-0.5 - 0.05 - 0.005 - 0.0005 - ...$ Yes. $r = \dfrac{1}{10}$ so the series con

3) $\dfrac{1}{2} - \dfrac{3}{8} + \dfrac{9}{32} - \dfrac{27}{128} + ...$

Yes. $r = \dfrac{3}{4}$ so the series converges. $S_\infty = 2$

4) $0.1 + 0.2 + 0.4 + 0.8 + ...$

No. r = 2

Write the first 4 terms of each infinite geometric series.

5) $t_1 = 4$ and $r = \dfrac{1}{5}$

$4 + \dfrac{4}{5} + \dfrac{4}{25} + \dfrac{4}{125}$

6) $t_1 = \dfrac{3}{2}$ and $r = -\dfrac{3}{8}$ $\dfrac{3}{2} - \dfrac{9}{16} + \dfrac{27}{128} - \dfrac{81}{1024}$

Determine the sum of each of the infinite geometric series.

7) $8 + 2 + 0.5 + 0.125 + ...$

$\dfrac{32}{3}$ or 10.666...

8) $-1 - \dfrac{3}{4} - \dfrac{9}{16} - \dfrac{27}{64} - ...$

-4

9) $10 - \dfrac{20}{3} + \dfrac{40}{9} - \dfrac{80}{27} + ...$

  6

10) $-2 + \dfrac{2}{3} - \dfrac{2}{9} + \dfrac{2}{27} - ...$ $-\dfrac{3}{2}$ or -1.5

Write a sentence to answer each question.

11) By looking at the common ratio, how do we know that the series is convergent?

  The common ratio is greater than -1 and less than 1

12) By looking at the common ratio, how do we know that the series is divergent?

  The common ratio is smaller than -1 and greater than 1

Find the indicated value.

13) $t_1 = 21$ and $S_\infty = 63$; Find r

  $r = \dfrac{2}{3}$

14) $r = \dfrac{3}{4}$ and $S_\infty = \dfrac{24}{7}$

  $t_1 = 6$

Use an infinite geometric series to express each repeating decimal as a fraction.

15) $0.4979797...$ $\dfrac{493}{990}$

16) $1.143143143...$ $\dfrac{1142}{999}$