Infinite Geometric Series

Date_____ Period____

Determine if each geometric series converges or diverges.

1) $a_1 = -3,\ r = 4$

2) $a_1 = 4,\ r = -\frac{3}{4}$

3) $a_1 = 5.5,\ r = 0.5$

4) $a_1 = -1,\ r = 3$

5) $81 + 27 + 9 + 3...,$

6) $7.1 + 17.75 + 44.375 + 110.9375...,$

7) $-3 + \frac{12}{5} - \frac{48}{25} + \frac{192}{125}...,$

8) $\frac{128}{3125} - \frac{64}{625} + \frac{32}{125} - \frac{16}{25}...,$

9) $\sum_{k=1}^{\infty} -4^{k-1}$

10) $\sum_{k=1}^{\infty} \frac{16}{9} \cdot \left(\frac{3}{2}\right)^{k-1}$

11) $\sum_{i=1}^{\infty} 4.2 \cdot 0.2^{i-1}$

12) $\sum_{k=1}^{\infty} \frac{7}{6} \cdot \left(-\frac{1}{4}\right)^{k-1}$

Evaluate each infinite geometric series described.

13) $a_1 = 3,\ r = -\frac{1}{5}$

14) $a_1 = 1,\ r = -4$

15) $a_1 = 1,\ r = -3$

16) $a_1 = 1,\ r = \frac{1}{2}$

17) $1 + 0.5 + 0.25 + 0.125...,$

18) $3 - \frac{9}{4} + \frac{27}{16} - \frac{81}{64}...,$

19) $81 - 27 + 9 - 3...,$

20) $1 - 0.6 + 0.36 - 0.216...,$

21) $\sum_{k=1}^{\infty} 5 \cdot \left(-\frac{1}{5}\right)^{k-1}$

22) $\sum_{n=1}^{\infty} -6 \cdot \left(-\frac{1}{2}\right)^{n-1}$

23) $\sum_{i=1}^{\infty} \left(\frac{1}{3}\right)^{i-1}$

24) $\sum_{k=1}^{\infty} 4^{k-1}$

Determine the common ratio of the infinite geometric series.

25) $a_1 = 1,\ S = 1.25$

26) $a_1 = 96,\ S = 64$

27) $a_1 = -4,\ S = -\frac{16}{5}$

28) $a_1 = 1,\ S = 2.5$

Infinite Geometric Series

Date_____ Period____

Determine if each geometric series converges or diverges.

1) $a_1 = -3,\ r = 4$ Diverges

2) $a_1 = 4,\ r = -\frac{3}{4}$ Converges

3) $a_1 = 5.5,\ r = 0.5$ Converges

4) $a_1 = -1,\ r = 3$ Diverges

5) $81 + 27 + 9 + 3...,$ Converges

6) $7.1 + 17.75 + 44.375 + 110.9375...,$ Diverges

7) $-3 + \frac{12}{5} - \frac{48}{25} + \frac{192}{125}...,$ Converges

8) $\frac{128}{3125} - \frac{64}{625} + \frac{32}{125} - \frac{16}{25}...,$ Diverges

9) $\sum_{k=1}^{\infty} -4^{k-1}$ Diverges

10) $\sum_{k=1}^{\infty} \frac{16}{9} \cdot \left(\frac{3}{2}\right)^{k-1}$ Diverges

11) $\sum_{i=1}^{\infty} 4.2 \cdot 0.2^{i-1}$ Converges

12) $\sum_{k=1}^{\infty} \frac{7}{6} \cdot \left(-\frac{1}{4}\right)^{k-1}$ Converges

Evaluate each infinite geometric series described.

13) $a_1 = 3,\ r = -\frac{1}{5}$

$\frac{5}{2}$

14) $a_1 = 1,\ r = -4$

No sum

15) $a_1 = 1,\ r = -3$

No sum

16) $a_1 = 1,\ r = \frac{1}{2}$

2

17) $1 + 0.5 + 0.25 + 0.125...,$

2

18) $3 - \frac{9}{4} + \frac{27}{16} - \frac{81}{64}...,$

$\frac{12}{7}$

19) $81 - 27 + 9 - 3...,$

$\frac{243}{4}$

20) $1 - 0.6 + 0.36 - 0.216...,$

0.625

21) $\sum_{k=1}^{\infty} 5 \cdot \left(-\frac{1}{5}\right)^{k-1}$

$\frac{25}{6}$

22) $\sum_{n=1}^{\infty} -6 \cdot \left(-\frac{1}{2}\right)^{n-1}$

-4

23) $\sum_{i=1}^{\infty} \left(\frac{1}{3}\right)^{i-1}$

$\frac{3}{2}$

24) $\sum_{k=1}^{\infty} 4^{k-1}$

No sum

Determine the common ratio of the infinite geometric series.

25) $a_1 = 1,\ S = 1.25$

0.2

26) $a_1 = 96,\ S = 64$

$-\frac{1}{2}$

27) $a_1 = -4,\ S = -\frac{16}{5}$

$-\frac{1}{4}$

28) $a_1 = 1,\ S = 2.5$

0.6