Math 3H Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Per:\_\_\_

11.4 Infinite Geometric Series

Identify the common ratio. Then determine if the geometric series will converge or diverge.

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| 1. $0.0004-0.004+0.04-…$
 | 1. $-\frac{1 }{24}+\frac{1}{12}-\frac{1}{6}+\frac{1}{3}-…$
 | 1. $3+\frac{3}{4}+\frac{3}{4^{2}}+\frac{3}{4^{3}}+…$
 |
| 1. $\sum\_{k=1}^{\infty }47\left(0.01\right)^{k}$
 | 1. $\sum\_{k=1}^{\infty }\frac{1}{2}\left(1.02\right)^{k-1}$
 | 1. $\sum\_{k=1}^{\infty }18\left(\frac{1}{3}\right)^{k-1}$
 |

Find the sum of each infinite geometric series.

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| --- | --- | --- |
| 1. $1+\frac{1}{3}+\frac{1}{9}+\frac{1}{27}+…$
 | 1. $1+\frac{3}{4}+\frac{9}{16}+\frac{27}{64}+…$
 | 1. $2-\frac{2}{5}+\frac{2}{25}-\frac{2}{125}+…$
 |
| 1. $1024+128+16+2+…$
 | 1. $12+6+3+\frac{3}{2}+…$
 | 1. $1+\frac{e}{π}+\frac{e^{2}}{π^{2}}+\frac{e^{3}}{π^{3}}+…$
 |
| 1. $\sum\_{k=1}^{\infty }3\left(0.1\right)^{k-1}$
 | 1. $\sum\_{k=1}^{\infty }\left(\frac{2}{π}\right)^{k}$
 | 1. $\sum\_{k=1}^{\infty }\left(\frac{e}{3}\right)^{k-1}$
 |
| 1. $\sum\_{k=1}^{\infty }83\left(\frac{1}{100}\right)^{k}$
 | 1. $\sum\_{k=1}^{\infty }-2\left(0.6\right)^{k-1}$
 | 1. $\sum\_{k=1}^{\infty }\left(\frac{1}{3}\right)\left(\frac{1}{2}\right)^{k-1}$
 |

1. The height a ball bounces is less than the height of the previous bounce due to friction. Suppose a ball is dropped from a height of 4 feet and rebounds to 98% of the height of the previous bounce. Write the series in sigma notation. What is the total vertical distance traveled by the ball when it comes to rest?
2. Because of friction and air resistance, each swing of a pendulum is a little shorter than the previous one. Suppose the first swing of a pendulum has a length of 5 inches and the return swing is 4.8 inches. Write the series in sigma notation. What is the total distance traveled by the pendulum when it comes to rest?

Simplify.

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| 1. $f\left(x\right)=\frac{-5x^{3}+4x^{2}+6x}{x}$
 | 1. $\frac{x^{2}-4}{x+2}$
 | 1. $f\left(x\right)=\frac{x^{2}-5x+4}{x^{2}+2x-3}$
 |