NAME _____ DATE _____ PERIOD _____

12-3

# Practice

## Infinite Sequence and Series

***Find each limit, or state that the limit does not exist and explain your reasoning.***

**1.** $\lim_{n\to\infty} \frac{n^2-1}{n^2+1}$

**2.** $\lim_{n\to\infty} \frac{4n^2-5n}{3n^2+4}$

**3.** $\lim_{n\to\infty} \frac{5n^2+1}{6n}$

**4.** $\lim_{n\to\infty} \frac{(n-1)(3n+1)}{5n^2}$

**5.** $\lim_{n\to\infty} \frac{3n-(-1)^n}{4n^2}$

**6.** $\lim_{n\to\infty} \frac{n^3+1}{n^2}$

***Write each repeating decimal as a fraction.***

**7.** $0.\overline{75}$

**8.** $0.\overline{592}$

***Find the sum of each infinite series, or state that the sum does not exist and explain your reasoning.***

**9.** $\frac{2}{5}+\frac{6}{25}+\frac{18}{125}+\cdots$

**10.** $\frac{3}{4}+\frac{15}{8}+\frac{75}{16}+\cdots$

**11.** ***Physics*** A tennis ball is dropped from a height of 55 feet and bounces $\frac{3}{5}$ of the distance after each fall.

**a.** Find the first seven terms of the infinite series representing the vertical distances traveled by the ball.

**b.** What is the total vertical distance the ball travels before coming to rest?