PRACTICE7 Name___________________________________ Section______

1. Determine whether the sequence converges or diverges. If it converges, give the limit of the sequence.

   (a) $\left\{1, -\frac{1}{2}, \frac{1}{3}, -\frac{1}{4}, \frac{1}{5}, ...\right\}$

   (b) $\left\{\frac{3n}{4n+1}\right\}_{n=1}^{\infty}$

   (c) $\left\{\frac{\cos(n\pi)}{n}\right\}_{n=1}^{\infty}$

   (d) $\left\{\frac{(-1)^n (n+1)}{n}\right\}_{n=1}^{\infty}$

   (e) $\left\{\frac{3^{n+1}}{4^{n-1}}\right\}_{n=1}^{\infty}$

   (f) $\left\{\frac{3^{3n+1}}{4^{2n-1}}\right\}_{n=1}^{\infty}$

2. Determine the sum of the series:

   (a) $\sum_{n=0}^{\infty} 4\left(\frac{2}{5}\right)^n$

   (b) $\sum_{n=0}^{\infty} 3\left(-\frac{7}{8}\right)^n$

   (c) $\sum_{n=0}^{\infty} \frac{2^{2n}}{5^{n+1}}$

   (d) $\sum_{n=0}^{\infty} \frac{3^{3n+2}}{4^{2n}}$

   (e) $\sum_{n=1}^{\infty} \frac{4}{n^2+5n+4}$

   (f) $\sum_{n=3}^{\infty} \frac{3}{n^2-2n}$

   (g) $\sum_{n=1}^{\infty} \left(3^{1/n} - 3^{1/n+2}\right)$

3. Show whether the series converges or diverges by reason of a valid convergence test.

(a) $\sum_{n=0}^{\infty} \frac{4n}{1+9n^2}$

(b) $\sum_{n=0}^{\infty} \frac{4}{1+9n^2}$

(c) $\sum_{n=1}^{\infty} \frac{4\cos(2n)}{n^2}$

(d) $\sum_{n=1}^{\infty} \frac{2n}{n^3+n^2+1}$

(e) $\sum_{n=0}^{\infty} \frac{(-1)^n\, 7n}{1+9n^2}$

(f) $\sum_{n=0}^{\infty} \frac{(-1)^n\, 7n}{1+9n}$

(g) $\sum_{n=0}^{\infty} \frac{n^3 \cdot 2^n}{n!}$

(h) $\sum_{n=1}^{\infty} \frac{n \cdot 2^{n+2}}{3^{n+1}}$

(i) $\sum_{n=0}^{\infty} 6e^{-n}$