PRACTICE8 Name________________________________ Section______

1. Determine a direct formula for S_n, the nth term in the sequence of partial sums. Then use this formula to determine the sum S of the series. Note $S = \lim_{n\to\infty} S_n$.

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

   (b) $\displaystyle\sum_{n=1}^{\infty} \left(9^{\frac{1}{n}} - 9^{\frac{1}{n+3}}\right)$

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

   (d) $\displaystyle\frac{1}{2} - \frac{2}{5} + \frac{8}{25} - \frac{32}{125} + \frac{128}{625} - \frac{512}{3125} + \cdots$

2. Determine the interval of convergence of the given series.

   (a) $\displaystyle\sum_{n=0}^{\infty} \frac{4^n\, x^n}{3^n}$

   (b) $\displaystyle\sum_{n=0}^{\infty} \frac{4^n\, x^n}{n!}$

   (c) $\displaystyle\sum_{n=0}^{\infty} \frac{(-1)^n\, x^{2n}}{(2n)!}$

   (d) $\displaystyle\sum_{n=0}^{\infty} \frac{(x-3)^n}{(n+1)^2}$

   (e) $\displaystyle\sum_{n=0}^{\infty} \frac{x^n}{(n+1)\, 3^n}$

3. Write the given function as a power series. Be sure to stat the interval for which this function is equal to its power series.

(a) $f(x) = \dfrac{4}{1+3x}$

(b) $f(x) = \dfrac{4}{(1+3x)^2}$

(c) $f(x) = 4\ln(1+3x)$

(d) $f(x) = \dfrac{6}{x+8}$

(e) $f(x) = \dfrac{6}{(x+8)^2}$

(f) $f(x) = \dfrac{6}{(x+8)^3}$

(g) $f(x) = \dfrac{5}{1+4x^2}$

(h) $f(x) = 5\arctan(2x)$

(i) $f(x) = \dfrac{5x}{1+4x^2}$

(j) $f(x) = 5\ln(1+4x^2)$