Math 21 - Review for exam #3

1	Represent .15151515… as a fraction
2	Find the sum: $\sum_{10}^{\infty} 5(.34)^n$
3	Find the sum: $\sum_{1}^{\infty} \frac{-2}{n^2+2n}$
4	Demonstrate whether the series converges or diverges: A) $\sum_1^\infty \frac{n^2}{\sqrt{n^3+1}}$ B) $\sum_1^\infty \frac{(-1)^n}{\sqrt{n}}$ C) $\sum_0^\infty \frac{n}{2^n}$ D) $\sum_1^\infty \frac{1}{n^{\frac{3}{2}}}$ E) $\sum_2^\infty \frac{1}{n(\ln n)^2}$ F) $\sum_1^\infty \frac{n}{\sqrt{n^4+2}}$ G) $\sum_1^\infty \frac{n}{\sqrt{n^5+1}}$ H) $\sum_2^\infty \frac{1}{\ln n}(-1)^n$ $I)$ $\sum_1^\infty \frac{n^n}{n!}$ J) $\sum_1^\infty \frac{2^{4n}}{(2n+1)!}$ K) $\sum_1^\infty \frac{\left(\frac{3}{2}\right)^n}{n^2}$
5	Find the degree 2 Taylor polynomial of $f(x) = x^2 \cos x$ $about$ $c = \pi$
6	Find the interval of convergence for the following power series: A) $\sum_1^\infty (-1)^n \frac{x^n}{5^n}$ B) $\sum_1^\infty \frac{(-1)^n (x-5)^n}{n5^n}$ C) $\sum_0^\infty \frac{(x-1)^{n+1}}{(n+1)3^{n+1}}$ D) $\sum_0^\infty \frac{(-1)^n x^{2n}}{n!}$ E) $\sum_1^\infty \frac{n! x^n}{(2n)!}$
7	Find the power series of $f(x) = \frac{1}{1-x^2}$ $, centered\ at\ c = 0,$ and find the interval of convergence.
8	Find the power series of $f(x) = \frac{1}{5x+3}, centered\ at\ c = 0,$ and find the interval of convergence.
9	Find the power series of $f(x) = \arctan c$ centered at $c = 0$. $\left(Hint:\right.$ $\left. first\ find\ the\ power\ series\ of\ \frac{1}{1+x^2}\right)$.
10	Find the first four terms of the Taylor series of $f(x) = \sqrt{1+x}$, centered at $c = 0$.
11	Find the first four terms of the power series of $f(x) = \sin x \cos x$ centered at $c = 0$.
12	Find the power series of $f(x) = e^{-x^2}$ based on the Taylor series for e^x .
13	Find the first 3 non-zero terms of the power series for $(x) = e^x \ln(1+x)$.
14	Estimate e^{-1} with an error that is less than .001 .
15	Given that $f(x) = \sum_0^\infty \frac{(3x)^n}{n+1}$, find $F(x), where\ F'(x) = f(x) and\ F(0) = 0$
16	What is the power series of $f(x) = e^x$?
17	Find the general n^{th} term of the Taylor series for $f(x) = \frac{1}{(1+x)^2}$ $centered\ at\ c = 0.$